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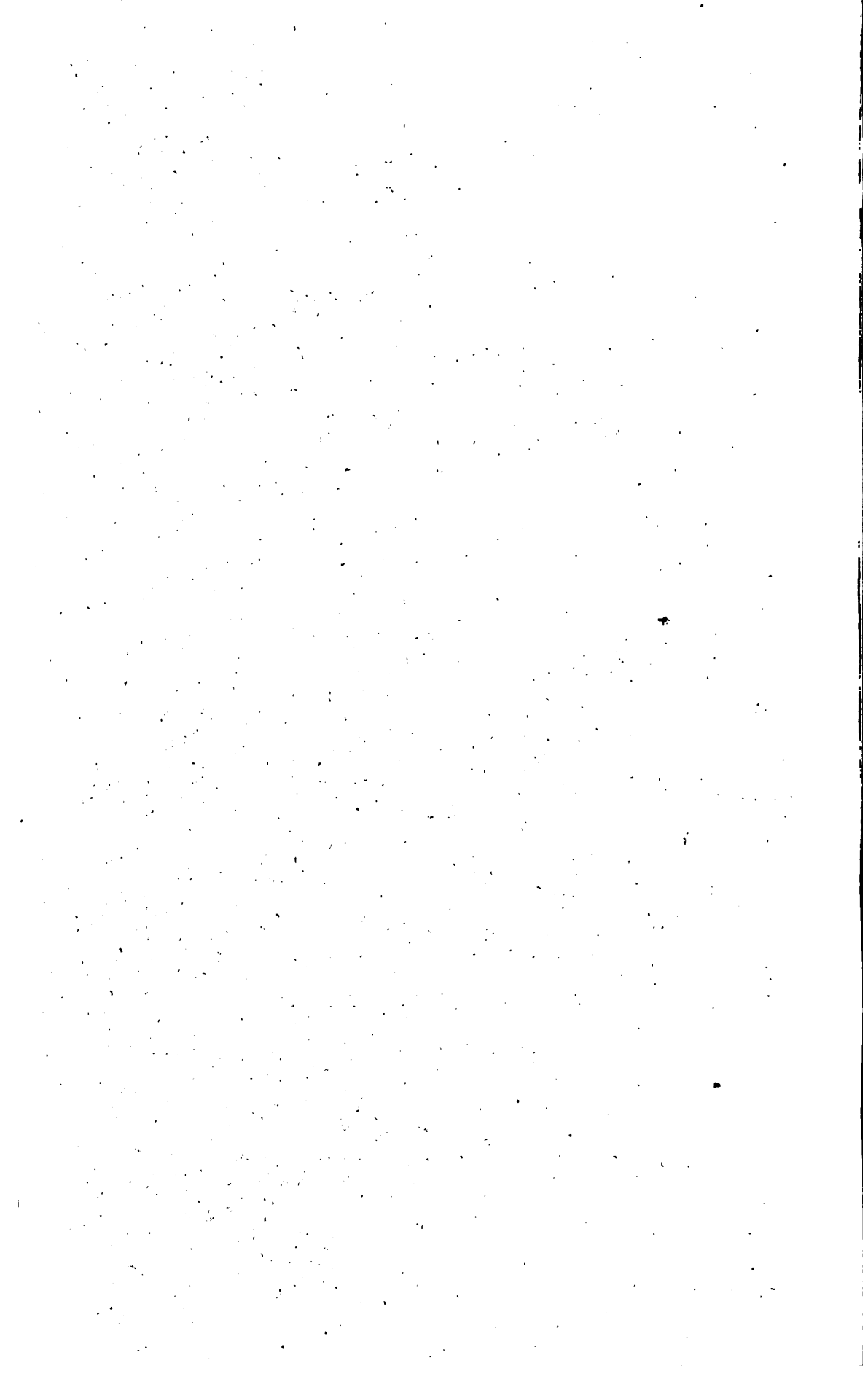
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**REPORT ON
THE PENSION FUNDS
OF THE
CITY OF NEW YORK**

PART I

**OPERATION OF THE
NINE EXISTING PENSION FUNDS**

**COMMISSION ON PENSIONS
City of New York
1916**



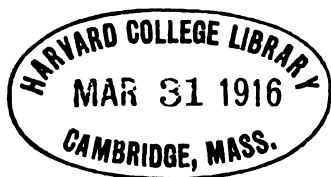
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INTRODUCTION

This report is Part I of the final report on the investigation conducted for the Commission on Pensions under my direction. It contains a descriptive analysis of the existing nine pension plans now conducted for the benefit of city employees, in large part at public expense. The report calls attention to a condition of inequality in pension powers and extravagance of pension policies inevitably resulting from such haphazard and ill-considered legislation as has put into operation the present pension systems. The purpose of the report is, however, to present the facts for the consideration of the commission and the city authorities, city employees and the public generally, in order that a sound conclusion may be reached regarding pension reorganization so urgently needed.

Attention is especially directed to the information contained in the tables. There will be found cogent illustration of existing defects and suggestive facts helpful in clarifying proposals for reconstruction.

The present report is Part I of the final report of the Commission. Part II will present the results of the Commission's actuarial investigations of the existing funds, together with the valuation of future cost of continuing the plans now in force. Part III will outline, with argument and illustration, alternative plans for reconstructing the pension system (now systems) of the city on a sound financial and equitable basis. Part IV will present the actuarial calculations supporting the constructive recommendations, together with rates of contribution, etc.

Separate reports will be published on the present condition and past operation of all the individual pension plans now in operation, similar to the descriptive and critical parts of the special report on the Teachers' Retirement Fund already published.

I wish to acknowledge the services of Mr. Robert von Reutlinger of the Commission's staff in the preparation of this report.

It is very earnestly desired that all parties concerned, and especially employees having the interest of the public service generally at heart, will give careful thought to the facts presented herein, in order that the Commission on Pensions may have the benefit of matured suggestions in framing its constructive recommendations.

HENRY BRUÈRE,
*Vice-Chairman and Secretary,
Mayor's Commission on Pensions.*

NEW YORK, February 17, 1916.

TO THE COMMISSION ON PENSIONS,
CITY OF NEW YORK.

GENTLEMEN:

I beg herewith to submit a summary report on the nine active pension plans in operation in the government of the city of New York. This report constitutes Part I of the final report of the investigations which the Commission directed me to make. Three additional parts will be submitted in order.

Respectfully submitted,
HENRY BRUÈRE,
Vice-Chairman and Secretary.

MR. GEORGE W. PERKINS, Chairman.

FRANK H. BETHELL

JOHN A. BOLLES

RAYNAL C. BOLLING

JOHN H. BOSCHEN

WILLIAM H. CHOROSH

MRS. F. H. COTHREN

ALBERT DE ROODE

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AUGUST FERRAND

JOSEPH HAAG

LOUIS H. HAHLO

FRANCIS D. POLLAK

ARTHUR WILLIAMS

S. HERBERT WOLFE

CHAPTER I

DEVELOPMENT AND SCOPE OF PENSION FUNDS

Funds Developed on Initiative of Employees

The most ineffective and expensive way of dealing with superannuated and incapacitated employees is to place dependence on enforced reductions and dismissals of the incapacitated, on the basis of efficiency ratings or for other causes, rather than on the basis of a sound pension system.

Employees cannot be regulated in the same manner as machinery, and efficiency methods which fail to take into account the demands of human nature will invariably prove unsuccessful. A too strict application of efficiency requirements with no provision for the care of the superannuated forfeits the goodwill of employees and results in indifferent work and unstable service. On the other hand, the omission of all safeguards for the integrity of the service results in the retention on full pay of the aged and infirm, and the consequent blocking of promotion of younger employees who either have to stifle ambition or seek employment where better conditions prevail. This means demoralization of the service and, although it is impossible to measure the effect in dollars and cents, represents the most important reason for the adoption of a sound system of retirement allowances.

It must be understood that the need of a retirement system is not peculiar to any particular group of employees, but applies to the entire service. In the interest, therefore, of efficiency and equal justice, the city's attitude toward employees in all departments under like conditions should be one of strict impartiality. To obtain this result will require official initiative and guidance in the formulation of a sound pension policy.

In the development of the present pension plans for New York City employees, initiative was taken by those immediately to be benefited, the government maintaining an attitude of indifference. Groups of employees strongest in organization, with sentiment and politics coöperating, secured liberal pension legislation, while the employees of smaller departments, whose activities were less in the public eye, had to be content with less favorable provisions.

Provision for accidents in performance of duty nucleus of present system

The origin of the city's pension systems dates back as far as 1857, when the legislature established a fund for the relief of policemen injured in the performance of duty, and for their dependents in case such injury resulted in death. Recognition of the city's obligation for accidents in the performance of hazardous duty was also the basis of the establishment of the pension fund for firemen in 1866, after the creation of a paid fire department in 1865.¹

¹ The original pension law for firemen was passed in 1866. It was inoperative, however, until 1871, when the fund began to make its first payments.

In both funds the initial provision was the payment, in case of accidental death, of a lump sum of \$2,000 to the estate of the deceased employee. A lump sum of \$1,000 was provided for permanently disabled policemen, while the permanently disabled firemen received a pension of \$240 per annum.

In the subsequent development of the funds of the police and fire departments, the lump sum benefits were replaced by pensions originally fixed at \$150 per annum, later changed to \$300 per annum, and finally increased to $\frac{1}{2}$ of final salary for disabled firemen and $\frac{1}{4}$ to $\frac{1}{2}$ of final salary for disabled policemen. The pensions to widows and children were increased from the original \$150 per annum to the present maximum of \$600 in the police pension fund, and to not exceeding $\frac{1}{2}$ of final salary¹ of the deceased fireman. Dependent parents of firemen were made eligible to benefits in 1896, while dependent parents of policemen became beneficiaries in the police pension scheme in 1907.

Liberalization of police and firemen's pensions encouraged introduction of teachers' and health officers' pensions in 1894

The liberalization of the provisions of the police and fire funds was not restricted to pensions granted in cases of injury and death in the performance of duty. The principle of retirement for disability not incurred in the performance of duty was established in the police pension fund in 1867 and in the fire department pension fund in 1877. Retirement on application after 20 years' service, without proof of incapacity, was first allowed to policemen in 1878 and to firemen in 1894. Pensions to dependents of policemen and firemen were also liberalized. In 1864, widows and children of policemen were made eligible to benefits in case of death in active service, though not resulting from performance of duty. In 1871, dependents of firemen were likewise benefited. In 1879, the practice was introduced of continuing pensions of deceased firemen at reduced amounts to their widows and children. A similar provision was adopted by the police pension fund in 1882.

The provisions made for contingencies which do not arise directly as the result of the hazardous occupation of policemen and firemen, and are, therefore, applicable to any city employee, supplied precedents for the establishment of pension funds in other branches of the service. The employees of the health department were the first to profit. Their pension fund was established in 1894. Pension legislation for Manhattan teachers was passed in 1894, and for Brooklyn teachers in 1895,—the two pension funds being consolidated in 1901.

Precedents established helped employees to effect city-wide pension system

General development of pension policies for policemen, firemen and teachers, as well as for employees in private corporations, began early in this century and has continued at an accelerating rate during the last few years.

¹ Not exceeding \$1,000 in the case of the widow, and not exceeding \$500 for each child.

Employees in other branches of the city's service realized their opportunity. Aided by the example of local precedents and similar developments in other cities, the teaching staff of the College of the City of New York secured the establishment of a pension fund in 1902. In 1905, a law was passed for the retirement for disability after 30 years' service, of employees of the department of finance, and the first beneficiary, a bookkeeper of the chamberlain's office, for whose benefit the law was drafted, retired on January 1, 1906. This law was subsequently amended in 1911 and, known as the "Grady Law," extended its benefits to all city employees not provided for by existing pension funds.

The employees of the street cleaning department, after several years of agitation, secured the passage of a bill for their retirement under special provisions in 1911. In the same year a pension fund was established for the employees of the Supreme Court, First Department, and in 1913 the retirement provisions for the employees of the Supreme Court, Second Department, were enacted as the latest addition to the then existing eight municipal pension plans.

The development of the city's pension system was not limited to the enactment of laws for the establishment of the various funds. Increases in the original benefit scales, the liberalizing of conditions for eligibility to pension, and the extension of benefits to new classes of beneficiaries were the main objects of numerous legislative amendments. The additional burdens so imposed on the funds were counterbalanced only in a slight degree by legal provisions requiring contributions to the funds from prospective beneficiaries. The policemen were first required to contribute 2% of salary in 1893, the teachers of Brooklyn contributed 1% of salary during the period from 1896 to 1901. Since 1905 such contributions have been required of all teachers. The health department employees have contributed 1% of salary since 1907, the street cleaners 3% of salary since 1911, and the employees of the Supreme Court, First Department, 1% of salary since 1913.

Due to this fitful and unsystematic development, the present pension laws regulating the benefits and income of the various funds present a tangled mass of conflicting provisions. To facilitate a general perspective, their main features as well as statistics indicative of the scope of each of the present nine pension funds are presented in a comparative statement opposite page 4.

More than one-half of service covered by special provisions

A study of this statement brings out the fact that the special departmental pension funds confer on the majority of city employees exceptional privileges, such as retirement after 20 to 30 years of service without proof of disability, retirement for disability occurring after short periods of service, and pensions to dependents of employees who die while in service and of deceased pensioners. These privileges are not enjoyed as yet by the employees covered by the general provisions of the "Grady Law," which

require proof of incapacitating disability as well as 30 years of service for eligibility to retirement.

Employees in the active service who are covered by the provisions of the nine pension funds are grouped by titles and annual compensation and form the subject matter of Tables 1 to 9, pages 88 to 103. A summary of the number of employees, average salary and total annual salary is presented as follows:

	Number in Active Service	Average Annual Salary	Total Annual Salary
<i>Special Departmental Pension Funds:</i> ¹			
Police Pension Fund.....	10,708	\$1,405.04	\$15,045,210.00
Fire Department Relief Fund.....	5,004	1,503.78	7,524,900.00
Teachers' Retirement Fund.....	21,317	1,420.66	30,284,217.00
Health Department Pension Fund.....	1,256	1,040.18	1,306,464.00
College of the City of New York Retirement Fund	223	2,275.78	507,500.00
Dept. of St. Cleaning Relief and Pension Fund...	5,474	835.35	4,572,686.50
Supreme Court, First Dept., Retirement Fund	295	2,317.46	683,650.00
Supreme Court, Second Dept., Retirement Fund	177	2,249.44	398,151.23
Total.....	44,454	\$1,356.97	\$60,322,778.73
<i>General, City of New York Employees' ("Grady") Retirement Fund:</i> ²			
Mechanics.....	6,064	\$1,494.01	\$9,059,650.00
Laborers, Men.....	10,841	779.43	8,449,750.00
Laborers, Women.....	1,174	380.69	446,930.00
Clerks, Men.....	9,745	1,332.62	12,986,380.00
Clerks, Women.....	2,532	866.74	2,194,590.00
Exempt Employees.....	2,500	1,796.33	4,490,830.00
Total.....	32,856	\$1,145.24	\$37,628,130.00
Grand Total.....	77,310	\$1,266.99	\$97,950,908.73

¹ The figures for the special pension funds apply to the active force as of December 31, 1914, with the exception of the Teachers' Retirement Fund indicating the active teaching force as of May 31, 1915.

² Employees covered by the provisions of this fund do not include appointive and elective officers nor temporary employees whose chances for eventual retirement are remote and improbable. The figures show the status of the force on June 30, 1914.

As shown above, 44,454 employees, or 57.5%, of the total municipal service numbering 77,310 men and women, are subject to the more liberal provisions of the city's pension systems. It must be observed that on the whole their compensation for active service, as indicated by the average annual salary of \$1,356.97, is more favorable than the pay received by the 32,856 employees covered by the comparatively stringent provisions of the "Grady Law," the corresponding average being \$1,145.24 per annum. The only exceptions in the former group are the street cleaners, whose average annual pay is \$835.35. It must be pointed out, however, that the granting of special pension provisions to these employees took place after long and continuous agitation on their part, and after submitting to a deduction of

Department of Street Cleaning Relief and Pension Fund	Supreme Court, First Department, Retirement Fund	Supreme Court, Second Department, Retirement Fund	Total, All Funds
1911	1911	1914	
num. $\frac{1}{2}$ final pay er 20 years' service, years of age	$\frac{1}{2}$ of average last 2 years' pay after 25 years' service	No provision	.....
60	43		
num. $\frac{1}{2}$ final pay er 10 years' service	Maximum, $\frac{1}{2}$ of average last 2 years' pay after 30 years' service	Maximum, $\frac{1}{2}$ of average last 2 years' pay after 25 years' service	.....
after less than 10 years' service num. $\frac{1}{2}$ pay after years' service	Same as "ordinary" dis- ability	Same as "ordinary" dis- ability	.....
10 years' service— 00 to widow or children by time; \$300 to widow, 00 to children and de- pendent parent to widow or children	No provision No provision No provision	No provision No provision No provision	...............
	1%	None	.....
provision	Appropriations as required	Appropriations as required	.....
Unexpended balance of sal- ary appropriations eys for privilege of ow trimming or assort- g of refuse eys for sale of ashes, rbage and refuse	Unexpended balances of salary appropriations	None	.....
disciplinary and absence de- ductions from employees demned departmental property emption and sale of in- surance			
ations, interest	Interest	None	.....
5,474 484 8.84% \$4,667,298.06 \$163,053.71 3.49%	295 11 3.73% \$608,656.00 \$10,822.80 1.78%	177 1 .56% \$399,448.91 \$900.00 .23%	77,310 ^a 8,232 10.65% \$104,965,069.96 ^a \$5,053,167.84 4.80%
\$428,714.53 829,362.72 48,853.50 \$1,306,930.75 \$293,032.07 7,598.51 \$300,630.58 \$1,006,300.17	\$9,398.51 22,068.25 78.80 \$31,445.56 \$22,068.25 \$22,068.25 \$9,377.81	..... \$900.00 \$900.00 \$900.00 \$900.00 None	\$7,349,068.13 50,101,416.70 2,577,797.63 \$60,028,273.45 \$56,783,095.94 123,280.95 \$56,916,376.89 \$3,111,895.56

are not likely to become eligible for retirement. ^a Includes the salaries of temporary employees and

3% of salary for the benefit of their fund, which is the largest contribution exacted from any city employee.

Another feature, showing that present pension laws have disregarded principles of impartiality, is presented by the inclusion of employees engaged in non-hazardous occupations in groups eligible to extra-liberal pension benefits on account of exposure to danger and inclement weather in the line of duty. The clerical employees of the street cleaning department fund, as shown in Table 7, page 98, are entitled to the same provisions as the rank and file of street cleaners. In the health department (see Table 4), eligibility to the extremely liberal benefits of the pension fund is not restricted to employees who are exposed to possible danger from infectious diseases, but is extended to any employee agreeing to contribute 1% of salary. Thus, clerks, bookkeepers, laborers, etc., who do identically the same kind of work as is done in other departments covered by the 30-year disability provision of the "Grady Law," may on application leave the service in the best of health on a life income of $\frac{1}{2}$ of salary after 20 years of service. In the police pension fund, the inclusion of surgeons not subjected to exposure and the hazards of the policeman's work presents another instance of ill-considered pension legislation. The most striking example of discriminating generosity, however, is the clause in the police pension law entitling one clerical employee only—the bookkeeper of the department—to the provisions of the fund, without exacting from him the 2% salary contribution required from all other prospective beneficiaries.

Practically Entire Pension Burden Borne by Taxpayers

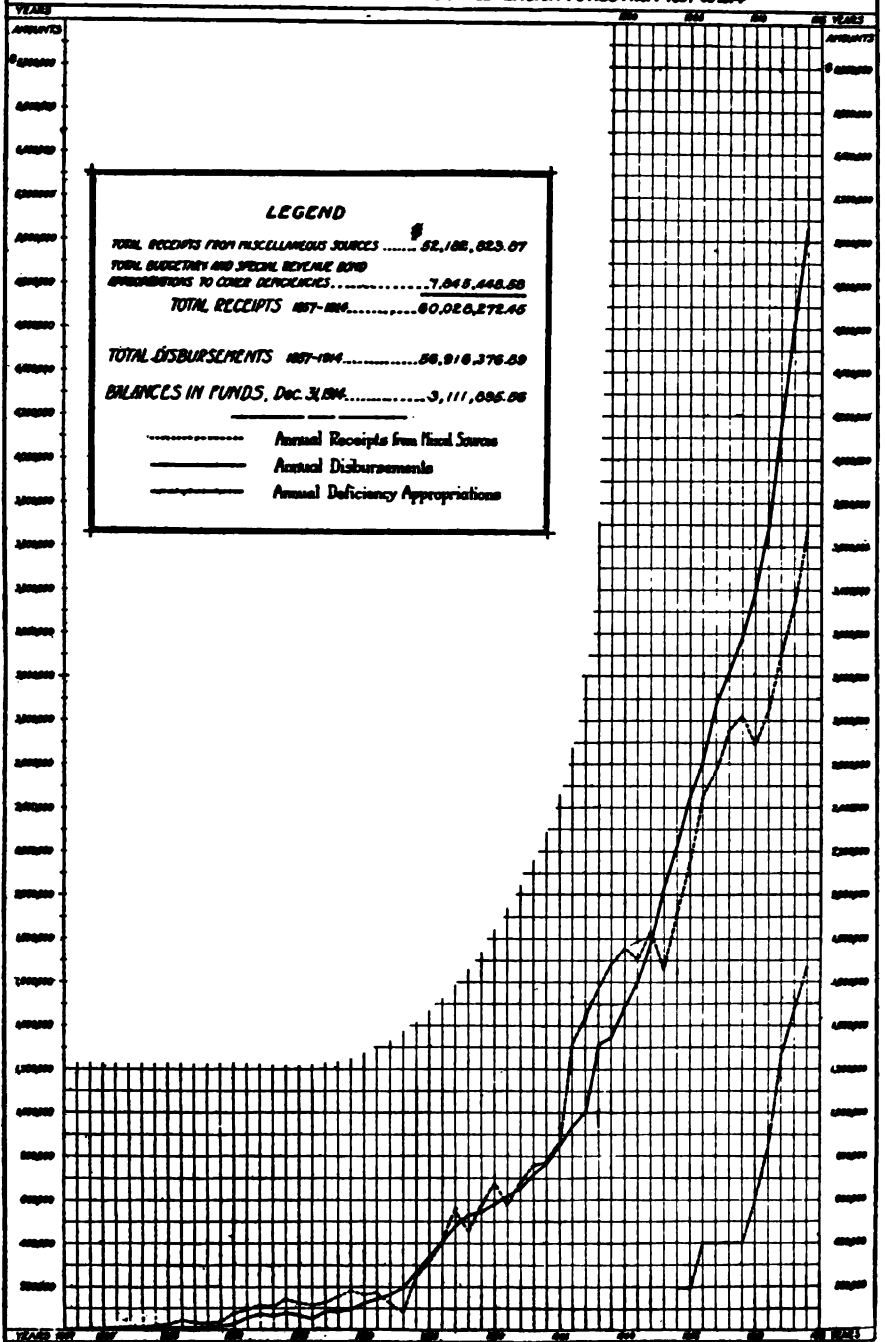
In order to show the financial operations of the nine municipal pension funds, their receipts and disbursements have been summarized in a statement presented in Table 51 opposite page 156. The growth of the annual pension payments from the combined funds is indicated by the solid, or "pension," line on the chart on page 6. The growth of the regular annual revenues of the funds received from various sources, as provided by law, is illustrated by the dotted, or "revenue" line, while the "deficit" line, drawn by means of dashes and circles, shows the discrepancy between revenues and matured pension claims. Since 1904 this discrepancy has been covered by funds from the general tax levy.

Over 61% of total 57 years' pensions disbursed in last 10 years

The rapid increase in annual payments from all funds, as shown in the chart, is due to a number of causes, of which the most important are the numerical growth and increases in rates of compensation of the active force, the gradual inclusion of all branches of the service in the city's pension system, and the continuing liberalization of the original pension provisions. The following summarized statement of pension expenditures in five-year

**CITY OF NEW YORK
COMMISSION ON PENSIONS
MUNICIPAL PENSION FUNDS**

ANNUAL RECEIPTS AND DISBURSEMENTS OF ALL PENSION FUNDS FROM 1887 to 1914



periods shows that over 61% of the disbursements of all city pension funds were made during the last 10 years of operation:

Period of Pension Disbursements	Amount of Disbursements	Per Cent. of Total Disbursements
1858 and 1859.....	\$270.00	.....
1860 to and including 1864.....	10,722.83	.02
1865 to and including 1869.....	55,063.03	.10
1870 to and including 1874.....	291,288.98	.51
1875 to and including 1879.....	380,823.49	.67
1880 to and including 1884.....	895,206.01	1.57
1885 to and including 1889.....	2,301,271.34	4.04
1890 to and including 1894.....	3,344,111.79	5.88
1895 to and including 1899.....	5,461,392.95	9.60
1900 to and including 1904.....	9,124,048.07	16.03
1905 to and including 1909.....	14,129,609.26	24.82
1910 to and including 1914.....	20,922,569.14	36.76
Total Disbursements.....	\$56,916,376.89	100.00

In considering the above statement, it must be remembered that the police pension fund was established in 1857, and the fire department relief fund in 1871. The pension funds for teachers and the employees of the department of health began to operate in 1894, and the recently established pension funds were created in the following years:

- 1902—College of the City of New York Retirement Fund
- 1906—Finance Department Retirement Fund (Extended in 1911, as shown below)
- 1911—City of New York Employees' Retirement Fund ("Grady Law")
- 1911—Department of Street Cleaning Relief and Pension Fund
- 1911—Supreme Court, First Department, Retirement Fund
- 1914—Supreme Court, Second Department, Retirement Fund

City paid more than 83% of total pensions

The total transactions of the nine pension funds during the past 58 years, as shown in detail in Table 51, opposite page 156, are summarized as follows:

	Amount	Per Cent. of Total
Receipts:		
Employees' Contributions.....	\$7,349,058.13	12.24
Indirect City Contributions.....	42,255,968.12	70.39
Direct City Contributions.....	7,845,448.58	13.07
Interest.....	2,271,951.22	3.79
Donations, bequests, rewards, etc....	305,846.40	.51
Total Receipts.....	\$60,028,272.45	100.00
Disbursements:		
Pension Payments.....	\$56,783,095.94	
Administrative Expenses.....	133,280.95	
Total Disbursements.....	\$56,916,376.89	
Balance in funds, Dec. 31, 1914.....	\$3,111,895.56	

Pension Fund	Years Fund in Operation	Pensioners on Roll Dec. 31, 1914		Pensions paid in 1914	
		Number	Per Cent. of Total	Amount	Per Cent. of Total
1. Police Pension Fund.....	58	4,234	51.4	\$2,456,805.13	48.6
2. Fire Department Relief Fund...	44	1,686	20.5	1,058,424.21	21.0
3. Teachers' Retirement Fund.....	21	1,549	18.8	1,183,397.08	23.4
4. Health Dept. Pension Fund.....	21	97	1.2	78,776.65	1.6
5. College of the City of N. Y. Retirement Fund.....	13	4	.1	4,325.00	.1
6. City of New York Employees' ("Grady") Retirement Fund	9	166	2.0	96,663.26	1.9
7. Dept. of Street Cleaning Relief and Pension Fund.....	4	484	5.9	163,053.71	3.2
8. Supreme Court, First Dept., Retirement Fund.....	4	11	.1	10,822.80	.2
9. Supreme Court, Second Dept., Retirement Fund.....	1	1	....	900.00	....
Total.....		8,232	100.0	\$5,053,167.84	100.00

Distribution of pensions among former employees and their dependents

The distribution of the 8,232 pensions among former employees and their dependents as of December 31, 1914, according to amounts paid, is shown in detail in Tables 22 to 24 opposite page 130. A summary of the data presented in these tables is given below:

EMPLOYEES' PENSIONS

Amount	Number	Per Cent. of Total
\$150 and less than \$600.....	983	17.0
\$600 and less than \$800.....	3,230	55.9
\$800 and less than \$3,500.....	1,560	27.1
\$3,500 to \$6,000.....	6	....
Total.....	5,779	100.0
Average annual Pension.....		\$759.65
Total Annual Charge.....		\$4,390,018.49

DEPENDENTS' PENSIONS

Amount	Number	Per Cent. of Total
\$50 and less than \$300.....	216	8.8
\$300 and less than \$350.....	2,129	86.9
\$350 and less than \$1,250.....	107	4.3
\$1,500	1	....
Total.....	2,453	100.0
Average Annual Pension.....		\$305.40
Total Annual Charge.....		\$749,148.00

CHAPTER II

THE BENEFITS

Scope of benefit provisions

As previously stated, the existing pension schemes have been established largely on the initiative of employees who were desirous of securing the most advantageous provisions for themselves and their dependents. The government neglected to harmonize the efforts of individual groups in the accomplishment of their aims, and to safeguard the service by seeing to it that only such measures were enacted as would accomplish beneficial results at a reasonable cost.

A review of the great variety of benefit provisions which have been placed on the statutes as a result of this one-sided development of retirement schemes, requires definition of the purposes which they should be expected to accomplish. This must be done from the viewpoint of benefiting the service, as it is difficult to justify a retirement system for public employees solely on the basis of personal advantage to the prospective beneficiaries. Following this method, the existing benefit provisions may be divided into the following three groups:

1. "*Superannuation*" pensions, by means of which employees who, being unable to earn their salaries, due to old age, are released from the service. These benefits are also known as "service" or "regular" pensions.

2. "*Disability*" pensions, applicable to employees who, because of ill-health due to disease or accident, have become incapacitated before complying with the requirements for "superannuation" or "regular" retirement. These benefits are also known as "invalidity" pensions.

3. "*Dependents*" pensions, granted to those dependent on the earnings of the employee, in case of his death while in active service or in retirement. These benefits are granted to the widow, minor children or dependent parents of the employee.

The details of the somewhat complicated provisions in the nine separately operating pension schemes have been compiled under the above indicated three groups, in the chart opposite page 12.

Superannuation Pensions

Provisions for the support of those who arrive at the unproductive period of life are considered first, because under a sound pension system producing a "stabilizing" influence on the service they should have a larger application than the "disability" and "dependents'" pensions, which deal with exceptional contingencies and are intended merely as collateral inducements for employees to enter and continue in service. The details of existing superannuation provisions are presented at the head of the statement and include the "service," "service and age" and "superannuation" pensions, according to the conditions regulating an employee's eligibility to these benefits.

All but two funds recognize superannuation principle

It will be noted that seven of the nine existing pension schemes have provisions of one kind or another applicable to employees who have supposedly passed the stage of efficiency and do not require medical certification of incapacity as a condition for retirement. The two funds which restrict eligibility to pension on the basis of certified proof of incapacity are the Supreme Court, Second Department, retirement fund and the City of New York employees' ("Grady") retirement fund. The benefits of these pension schemes are included, therefore, in the group of "disability" pensions.

The conditions determining an employee's eligibility to a "superannuation" or "regular" pension vary in the seven funds having superannuation provisions. In five of these funds the only requirement is a stated service period. This applies to retiring employees of the departments of fire, education and health, the College of the City of New York and the Supreme Court, First Department. The two other funds impose, in addition, a minimum age limitation,—55 years for policemen and 60 years for street cleaners.

Retirement under the above "service" and "service and age" provisions is optional on the part of the employee. In three funds only—the police pension fund, the teachers' retirement fund and the College of the City of New York retirement fund—the law gives the pensioning authority the right compulsorily to retire employees who have passed a stated age, under special "superannuation" provisions.

The number of employees retired under the provisions referred to and drawing pensions on June 30, 1914, and their average age at that date are presented in the statement¹ on page 13, which also includes, for purposes of comparison, the total number of pensioned employees on that date.

¹ Compiled from Tables 25 to 39, pages 133 to 146, presenting the distribution of pensioners in the several funds by cause of retirement and present average age.

	City of New York Employees' ("Grady") Retirement Fund	Street Cleaning Department Relief and Pension Fund	Supreme Court, First Department, Retirement Fund	Supreme Court, Second Department, Retirement Fund
After 20 years ¹	1/50 of last 2 yrs. ¹ avge. for ea. yr. ¹	.....
After 30 years ¹
After 25 years ¹	1/2 average of last 2 years.	.....
After 30 years ²
After 20 years ¹
After 25 years ²	1/2 average of last 2 years	.....
After 30 years ²	1/2 average of last 2 years	.....
25 years' serv ¹	Min. 1/2 final pay	.....	.....
20 years' serv ¹
Age 65 and 30
Age 65, 30 yrs
Age 60.....
Less than 10 y	\$300	.....	.....
After 10 years	Min. 1/2 final pay	See below	.....
After 20 years ¹	Max. 1/2 average of last 2 years	.....
After 20 years ²	Max. 1/2 average of last 3 years ^{1,3}	Min. 1/2 final pay	Max. 1/2 average of last 2 years	.....
After 25 years ¹	Max. 1/2 average of last 3 years ^{1,3}	Min. 1/2 final pay	Max. 1/2 average of last 2 years	Max. 1/2 average of last 2 years
After 30 years ¹	Max. 1/2 average of last 3 years ¹	Min. 1/2 final pay	Max. 1/2 average of last 2 years	Max. 1/2 average of last 2 years
Less than 10 y	Min. 1/2 final pay	See below	.....
After 10 years	Max. 1/2 average of last 2 years	.....
After 20 years ¹
After 20 years ²	Max. 1/2 average of last 3 years ^{1,3}	Min. 1/2 final pay	Max. 1/2 average of last 2 years	.....
After 25 years ¹	Max. 1/2 average of last 3 years ^{1,3}	Min. 1/2 final pay	Max. 1/2 average of last 2 years	Max. 1/2 average of last 2 years
After 30 years ¹	Max. 1/2 average of last 3 years ¹	Min. 1/2 final pay	Max. 1/2 average of last 2 years	Max. 1/2 average of last 2 years
Of members k ¹	Max. \$300	.....	.....
Of members d ¹	See below	.....	.....
Of members d ²	Max. \$200	.....	.....
Of pensioners ¹	Max. \$200	.....	.....
Of members d ¹
Of pensioners ¹
Of members k ¹	Max. \$200	.....	.....
Of members d ¹	See below	.....	.....
Of members d ²	Max. \$200	.....	.....
Of pensioners ¹	Max. \$200	.....	.....
Of members k ¹	Max. \$200	.....	.....
Of members d ¹
Of pensioners ¹

¹ In case \$1,500 for teachers and \$2,000 for supervising officials. ² Not more than \$600 to dependents of one member, 1/2 final pay; presidents and professors, at lowest even multiple of \$1,000, not less than one-half final pay. ³ For county offices considered. ⁴ To dependent widowed mothers only.

Pension Fund	Pensioned Employees on the Rolls on June 30, 1914	Employees Pensioned Under "Service," "Service and Age" and "Superannuation" Provisions		
		Number	Per Cent. of Total Pension Roll	Average Present Age
1. Police Pension Fund.....	2,716	851	31.3	67.0
2. Fire Department Relief Fund.....	899	582	64.7	58.6
3. Teachers' Retirement Fund.....	1,521	1,232	81.0	64.9
4. Health Department Pension Fund.....	81	73	90.1	57.9
5. College of the City of N. Y. Retirement Fund.....	4	4	100.0	74.8
6. N. Y. City Employees' ("Grady") Retirement Fund.....	106	....	....	....
7. Dept. of Street Cleaning Relief and Pension Fund.....	321	21	6.5	67.9
8. Supreme Court, First Dept., Retirement Fund.....	9	....¹	....	....
9. Supreme Court, Second Dept., Retirement Fund.....	1	....	....	....
Total.....	5,658	2,763	48.8	....

The following is a comparison of the number of retirements under "superannuation" provisions with the total number of retirements, during the six-year period ending June 30, 1914:²

Pension Fund	Total Number of Retirements, July 1, 1908, to June 30, 1914	Employees Pensioned Under "Service," "Service and Age" and "Superannuation" Provisions	
		Number	Per Cent. of Total Retirements
1. Police Pension Fund.....	1,668	373	22.36
2. Fire Department Relief Fund.....	549	354	64.48
3. Teachers' Retirement Fund.....	805	586	72.80
4. Health Department Pension Fund.....	61	56	91.80
5. College of the City of N. Y. Retirement Fund.....	3	3	100.00
6. N. Y. City Employees' ("Grady") Retirement Fund.....	116	....	....
7. Department of Street Cleaning Relief and Pension Fund.....	398	26	6.53
8. Supreme Court, First Department, Retirement Fund.....	9	....	....
9. Supreme Court, Second Department, Retirement Fund.....	1	....	....
Total,	3,610	1,398	38.73

¹ No pensions have been granted from this fund under its "service" provisions.

² Compiled from Table 19, page 124, showing the separations from the active service during the six-year period ending June 30, 1914.

Early retirements cause loss to city's service

Provisions giving employees the option to retire early in life without proof of incapacity, after having served a stated number of years, may be considered among the most objectionable features of the city's pension system. In foreign countries, civil service and industrial pension schemes set a minimum age limitation, generally 60, 65 or 70 years, for retirement on a regular, or superannuation, pension. When the requirement is a stated service period, its length, generally 35 years or over, is so calculated as to prevent "early" retirements. The same method is followed in the majority of industrial pension schemes in the United States. Only municipal pension funds in this country cling to the exploded theory that a given number of years in a department, rather than advanced age, determines the decline of usefulness of a public employee.

The "service" provisions in five of the city's pension funds permit the retirement, early in life, of employees who have entered the service at the minimum entrance ages, as may be seen from the following:

Pension Fund	Minimum Age of Entrance into Service	Years of Service Required for Optional Retirement	Age at Which Optional Retirement is Possible
Fire Department Relief Fund.....	21	20	41
Teachers' Retirement Fund.....	18	30	48
Health Department Pension Fund.....	14	20	34
College of the City of N. Y. Retirement Fund..	21	20	41
Supreme Court, First Department, Retirement Fund.....	18	25	43

The age limitation of 55 years after 25 years of service for retiring policemen is obviously low. The street cleaners must have passed the age of 60 years and have served 20 years before they may apply for pension.

Employees between the ages of 34 and 55 years are in the prime of life, and if they have had 20 or more years' experience they are in the majority of cases a distinct asset to the service. By permitting their retirement without proof of incapacity the city injures its own interests. Those who avail themselves of their pension rights at an early opportunity generally do so either to engage in business for themselves or to supplement their pension income through employment elsewhere. They represent the progressive and live element of the service, to whom the city should offer inducement to continue instead of encouragement to leave.

That the practice of early retirement is quite general is indicated by the following average ages at which employees who were on the pension roll on June 30, 1914¹, have retired under the "superannuation" provisions of the pension funds mentioned.

¹ Compiled from Tables 34 to 39, pages 143 to 146, showing the distribution of "service" or "superannuation" pensioners by years of service and age at appointment and retirement.

Pension Fund	Number of "Super- annuation" Pensioners on the Rolls on June 30, 1914	Average Age at Entrance into Service	Average Service Prior to Retire- ment	Average Age at Retire- ment
Police Pension Fund.....	851	27.9	28.5	56.4
Fire Department Relief Fund.....	582	26.7	25.3	52.0
Teachers' Retirement Fund:				
Men.....	71	33.1	33.8	66.9
Women.....	1,161	21.2	36.1	57.3
Health Department Pension Fund:				
Men.....	71	31.2	23.2	54.4
Women.....	2	25.5	28.5	54.0
College of the City of N. Y. Retirement Fund.....	4	59.0	12.3	71.3
Department of Street Cleaning Relief and Pension Fund.....	21	40.4	26.7	67.1

The data shown above is meager in the case of retirement of women employees of the health department and professors of the city college. The average service period does not include outside experience which is credited in retiring college professors and teachers of the general school system. In considering the retirement of policemen and street cleaners, the minimum age limitation of 55 and 60 years, respectively, must be kept in mind, and also the fact that up to a recent date the appointment of street cleaners was not regulated by maximum entrance age restrictions. Entering the department late in life, the minimum 20 year service restriction, rather than the age limitation of 60 years, controlled their optional retirement.

It will be noted that, with the exception of men teachers, college professors and street cleaners, those who retired under the supposed "superannuation" provisions of the six pension funds have done so at the average age of from 52 years in the fire department to 57.3 years in the case of women teachers in the department of education. It should be observed also that those who promptly availed themselves of the opportunity to retire, did so at ages well below those given above as averages.

The opportunity for optional early retirement in full health in departments covered by present "superannuation" provisions depends on the actual entrance age of employees and the service and age limitations imposed on applicants for voluntary retirement. The extent of this opportunity is illustrated by the number of employees of indicated age groups in active service on June 30, 1914, who, under existing provisions, are eligible to such retirement.¹

¹ Compiled from Tables 10 to 18, pages 106 to 122, showing the distribution of the active service by present age and years of prior service.

Pension Fund	Employees in Active Service on June 30, 1914	Employees Eligible to Optional Retirement, Classified by Age Groups				
		40 and Less Than 50	50 and Less Than 60	60 and Over	Total	Per Cent. of Active Force
Police Pension Fund.....	10,783	....	227	77	304	2.82
Fire Department Relief Fund.	5,009	194	187	41	422	8.42
Teachers' Retirement Fund:						
Men.....	2,608	....	22	28	50	1.92
Women.....	17,980	106	644	179	929	5.17
Health Department Pension Fund:						
Men.....	867	20 ¹	13	13	46	5.31
Women.....	395	3	1	....	4	1.01
College of the City of N. Y. Retirement Fund.....	218	11	8	14	33	15.14
Department of Street Cleaning Relief and Pension Fund...	5,426	....	....	70	70	1.29
Supreme Court, First Department, Retirement Fund....	294	3	23	20	46	15.65
Total.....	43,580	337	1,125	442	1,904	4.37

¹ Includes 4 men below age 40.

The propriety of offering the opportunity of voluntary retirement to 1,904 employees, or 4.37% of the active force, without proof of incapacity, depends principally on the age at which the average employee may be considered as unable to withstand the strain of his particular duties. A large proportion of the 442 eligible employees who have passed the age of 60 years, including especially the 188 policemen, firemen and street cleaners, are probably superannuated. The desirability, however, of offering the 1,125 employees between the ages of 50 and 60 years the option of leaving the service on pensions is seriously questioned. No logical justification whatever, except disability, can support the claim for retirement allowances of the 337 employees who have not yet reached the age of 50. The fact that they may be pensioned on their own volition is a serious indictment of the present pension policy.

Delayed retirements cause loss to city's service

Retirement from service on a pension income well below an employee's active compensation is an inducement to retire only to those who expect to supplement pension payments by their own efforts after retirement. On the other hand, with advanced age and consequent reduced opportunities for outside means of support, the prospect of a half-pay pension, requiring considerable curtailing of an employee's budget, becomes less and less alluring. Those, therefore, who do not retire in the prime of life develop a strong reluctance to give up their employment as they grow older, especially if there is a family dependent on their support. The resulting super-

annuation problem and consequent serious loss to the city through the stagnation of its service can only be avoided when the retirement of employees of advanced age is made mandatory by law.

None of the city's pension funds include such mandatory provisions. In the police pension fund and in the pension funds applicable to teachers and college professors, the law provides for compulsory retirement at ages 60 and 65, respectively. It gives discretion, however, to the pensioning authorities to enforce or disregard these rules. In the police pension fund the provision has not been generally applied. In the teachers' retirement fund, pursuant to a by-law of the board of education, automatic retirement of the teaching staff does not take place until age 70 is reached.

The presence of employees of advanced age in the various branches of the service covered by voluntary "superannuation" provisions indicates the shortcomings of a system which does not include mandatory retirement. The following statement¹ of employees in active service in the departments in question on June 30, 1914, who have passed the age of 60 years, illustrates this phase of the retirement problem:

Pension Fund	Employees in Active Service on June 30, 1914	Employees Over 60 Years of Age in Groups Indicated				
		60 and Less Than 65	65 and Less Than 70	70 Years and Over	Total	Per Cent. of Active Force
Police Pension Fund.....	10,783	71	21	6	98	.91
Fire Department Relief Fund.	5,009	34	9	3	46	.92
Teachers' Retirement Fund:						
Men.....	2,608	68	28	....	96	3.68
Women.....	17,980	192	51	4	247	1.37
Health Department Pension Fund:						
Men.....	867	26	15	13	54	6.23
Women.....	395	3	1	....	4	1.01
College of the City of N. Y. Retirement Fund.....	218	7	7	5	19	8.72
Department of Street Cleaning Relief and Pension Fund...	5,426	259	83	20	362	6.67
Supreme Court, First Department, Retirement Fund....	294	18	20	14	52	17.69
Total.....	43,580	678	235	65	978	2.24

The ineffectiveness of the present system as a superannuation measure, as well as its tendency to favor special groups of employees, is emphasized by the fact that 536 of the 978 employees of 60 years of age or over are not eligible to optional retirement, while 1,462 employees below that age may avail themselves of that privilege upon application. This condition in the various branches of the service is illustrated by the following statement¹:

¹ Compiled from Tables 10 to 18, pages 106 to 122, showing the distribution of the active force by present age and years of prior service.

Pension Fund	Em- ployees in Active Service on June 30, 1914	Employees 60 Years of Age or Over Who Are Not Eligible to Optional Retirement		Employees 60 Years of Age or Over Who Are Eligible to Optional Retirement		Employees Less Than 60 Years Old Who Are Eligible to Optional Retirement	
		Num- ber	Per Cent. of Active Force	Num- ber	Per Cent. of Active Force	Num- ber	Per Cent. of Active Force
Police Pension Fund.....	10,783	21	.19	77	.71	227	2.11
Fire Department Relief Fund.....	5,009	5	.10	41	.82	381	7.61
Teachers' Retirement Fund:							
Men.....	2,608	68	2.61	28	1.08	22	.84
Women.....	17,980	68	.38	179	1.00	750	4.17
Health Department Pension Fund:							
Men.....	867	41	4.73	13	1.50	33	3.81
Women.....	395	4	1.01	.....	.....	4	1.01
College of the City of N. Y. Retirement Fund.....	218	5	2.29	14	6.42	19	8.72
Department of Street Clean- ing Relief and Pension Fund.....	5,426	292	5.38	70	1.29	.....	.....
Supreme Court, First Depart- ment, Retirement Fund.....	294	32	10.88	20	6.80	26	8.85
Total.....	43,580	536	1.23	442	1.01	1,462	3.36

Old age in departments not covered by superannuation provisions

In branches of the service where superannuation provisions are lacking and the retirement of superannuated employees may be effected only on the ground of disability, after a stated number of years, old age exists in a high degree, as shown in the following statement¹:

Pension Fund	Em- ploy- ees in Active Service on June 30, 1914	Employees Over 60 Years of Age in Groups Indicated					Per Cent. of Active Force
		60 and Less Than 65	65 and Less Than 70	70 Years and Over	Total		
New York City Employees' ("Grady") Retirement Fund.....	32,856	1,506	1,095	1,018	3,617		11.01
Laborers, Men.....	10,841	772	577	547	1,896		17.49
Laborers, Women.....	1,174	51	22	11	84		7.16
Clerks, Men.....	9,745	329	237	267	833		8.55
Clerks, Women.....	2,532	12	10	6	28		1.11
Mechanics.....	6,064	272	193	151	616		10.16
Exempt employees.....	2,500	70	56	34	160		6.40
Supreme Court, Second Depart- ment, Retirement Fund ...	138	8	11	14	33		23.91
Total.....	32,994	1,514	1,106	1,030	3,650		11.06

¹Compiled from Tables 15 and 18, pages 113 to 122, showing the distribution of the active force by present age and years of prior service.

The above figures show that 3,650 employees, or 11.06% of the active force, are 60 years of age or over, 2,136 employees, or 6.47%, are past 65 years of age, and 1,030 employees, or 3.12%, are past 70.

The New York City employees' retirement fund and the Supreme Court, Second Department, retirement fund require a service period of 30¹ and 25 years, respectively, for retirement on the basis of certified proof of incapacity. The highly unstable character of the service covered by the general provisions of the New York City employees' retirement fund is indicated by the large number of resignations and dismissals as shown in Table 19, page 124. The younger employees have been affected mostly. Those employed late in life have shown a tendency to remain in service, owing, presumably, to their larger family responsibilities and to the reduced opportunity for outside employment. Only a small proportion of the aged employees, therefore, have served the required number of years to come under the retirement provisions. This shortcoming of the law as a superannuation measure is fully illustrated by the statement¹ below, and is accentuated by a comparison with similar data showing the condition existing in branches of the service covered by the superannuation provisions discussed in the preceding pages.

Pension Funds	Employees in Active Service on June 30, 1914	Employees Over 60 Years Old Who Are <i>Not Eligible</i> to Retirement		Employees Over 60 Years Old Who Are <i>Eligible</i> to Retirement		Employees Less Than 60 Years Old Who Are <i>Eligible</i> to Retirement	
		Number	Per Cent. of Active Force	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force
Seven Pension Funds Carrying Special Optional "Service" and "Superannuation" Provisions.....	43,580	536	1.23	442	1.01	1,462	3.35
Two Pension Funds Restricting Retirement to Employees Disabled After 30 ² and 25 Years of Service.....	32,994	3,323	10.07	267	.81	60	.18
All Pension Funds.....	76,574	3,859	5.04	709	.93	1,522	1.99

It must be noted that the 536 employees over 60 years of age in departments covered by superannuation provisions are shown as not eligible to

¹Compiled from Tables 10 to 18, pages 106 to 122, showing the distribution of the active force by present age and years of service.

²Under the provisions of the "Grady Law" Civil War veterans may be retired after 20 years of service if found disabled. There were 657 veterans in the service on June 30, 1914. Of this number 87 had a service of more than 20 and less than 30 years, as shown in Table 15f, page 119.

retirement on their own volition. The majority of them may be retired on the initiative of the pensioning authorities under compulsory "superannuation" and "disability" features of the corresponding seven pension schemes. On the other hand, none of the 3,323 employees who have passed the age of 60 years and served in branches of the service covered by the restricted pension provisions of the two funds in question may be placed on the retirement roll even if found disabled. The majority of the 327 employees in the service covered by the restricted funds who were below and above age 60 on June 30, 1914, and were eligible to retirement, have since been pensioned. The New York City employees' retirement fund has added, since that date and up to December 31, 1915, 277 pensioners to its roll, which includes several employees who have become eligible since June 30, 1914. Having almost exhausted its retirement possibilities, this, the largest of the nine existing pension funds, is powerless to cope with the superannuation problem, the seriousness of which is indicated by the fact that over 10% of the active force have passed the age of 60 years. In comparison with this condition, the right of 1,462 employees below age 60 in the seven favored departments to voluntary retirement, regardless of incapacity, is significant. It is a privilege not warranted by the interests of the service, and was conferred by provisions of law designed primarily for the personal advantage of groups of employees who stood behind their enactment.

Flat one-half salary pensions favor those least deserving

The pensions granted to employees who retire under the "service," "service and age" or "superannuation" provisions of existing pension funds are set forth in the statement of benefit provisions page 12. The law specifies the amount of these "regular" pensions of policemen, firemen, the teaching staff of the College of the City of New York and street cleaners at *not less than* $\frac{1}{2}$ of salary received at the date of retirement. The pensions of employees of the health department, on the other hand, are limited to *not exceeding* $\frac{1}{2}$ of final pay. The pension scale of employees of the Supreme Court, First Department, provides for $\frac{1}{2}$ of the average salary of the two years preceding retirement. The pensions of teachers are fixed at $\frac{1}{2}$ of final salary. The teachers' retirement fund, however, contains an exceptional provision for the benefit of the president and professors of Hunter College, whose half salary pensions are raised to the next even multiple of \$1,000. Similarly, the College of the City of New York retirement fund increases the $\frac{1}{2}$ of salary benefits of the president by \$1,000 and the vice-president by \$500. The pensions of professors may be increased to \$3,000 if $\frac{1}{2}$ of final pay is less than this amount.

The only fund imposing an additional minimum limitation is that of the teachers. Pensions granted after a minimum service of 30 years may not be less than \$600 per annum. This provision became inoperative long ago, as under existing salary schedules no teacher with over 15 years of service receives less than \$1,500 and the pension of $\frac{1}{2}$ of final salary automatically fixes the minimum amount receivable at \$750 per annum.

This fund also restricts the amount of pension under the $\frac{1}{2}$ of final salary provision to \$1,500 per annum for teachers and principals and to \$2,000 per annum for supervising officials. This latter restriction affects at the maximum only about 2% of the entire force, as may be seen from Table 3 on p. 90, showing the composition of the teaching force by grades and average rates of compensation.

Viewing the existing pension rates as a whole, one-half of final salary is the pension generally granted. Where the legal definition of the pension is "*not exceeding*" one-half of salary, it invariably has been interpreted to mean $\frac{1}{2}$ of salary. The provisions stipulating a pension of "*not less*" than $\frac{1}{2}$ of salary received, as a general rule receive the same interpretation, with few exceptions which are separately discussed on pages 32 to 34.

The unfairness of this pension scale is obvious from the fact that a pension of $\frac{1}{2}$ of salary is granted to firemen, employees of the health department, college professors and street cleaners after a minimum service of 20 years, to policemen and employees of the Supreme Court, First Department, after 25 years, and to teachers after 30 years. Ill-considered and expensive legislative favoritism, instead of a measurement of the comparative physical and mental strain on employees engaged in the various occupations, seems to be the basis of the differences in the length of the service period required for retirement on maximum pension. What may be a reasonable period of service for firemen, for example, may be an absurdly inadequate period for college professors and health department employees.

Another serious defect lies in the fact that additional service does not result in additional pension. Those who take advantage of service provisions to retire at the earliest opportunity, and therefore deserve the least recognition on the part of the city, have the benefit of more pension payments. Those who devote to the city's service their life-long efforts receive the same half-salary pension which, on account of their advanced age at retirement, they are able to enjoy only for a few years.

The persistent adherence by the majority of United States municipal pension funds to this antiquated practice is the more surprising in view of the almost universal recognition elsewhere of the advantages of logically relating the amount of pension to the value of services rendered. This is accomplished by grading an employee's pension in accordance with the number of years he has served. Abroad, $\frac{1}{80}$ to $\frac{1}{60}$ of salary for each year of service is the commonly accepted basis of grading the pension. Industrial pension schemes in this country generally grant benefits of 1% of salary for each year of service.

Salary at retirement objectionable basis for pensions

With the exception of the pensions granted from the Supreme Court, First Department, retirement fund at $\frac{1}{2}$ of the average salary of the last two years, schemes providing superannuation benefits use as a basis for fixing the amount of pension the salary received by a prospective beneficiary at the date of retirement. This arrangement results in unduly increased pensions to those

whose retirement follows soon after a change in salary schedules and gives the beneficiaries an unwarranted advantage over those whose pensions were based on the lower salary rates. On the other hand, in the event of salary reductions, the consequently reduced pension is unfair to the employee. Finally, there is always the possibility of unwarranted promotion of an employee to a higher paying position shortly before retirement for the purpose of granting a larger pension.

Credit for "outside" experience a costly practice

In three of the city's pension schemes service rendered outside of the City of New York is credited to the employee in determining his eligibility to retirement. The provisions of the Supreme Court, First Department, require from the prospective beneficiary a total service of 25 years of which only the last $12\frac{1}{2}$ years must have been rendered in the department, the other $12\frac{1}{2}$ years being credited if the service was for the State of New York. In the event of loss of position through no fault of an employee the service requirement is reduced to 20 years and only the last 10 years must have been in the department. Outside professional experience of as much as 20 years anywhere in this country or abroad, in addition to a minimum of 10 years in the College of the City of New York entitles teachers in that institution to a full pension. A similar minimum requirement of 15 years in city schools and 15 years' experience elsewhere is included in the provisions of the teachers' retirement fund. Finally, the staff of Hunter College may be retired after 30 years of professional experience without the requirement of a minimum service in the city.

The practice of crediting outside experience has no doubt a practical value, at least when it is applied to the teaching profession, by offering experienced teachers an inducement to enter the city's service and at the same time enabling their retirement on an adequate pension after their period of usefulness expires. In accomplishing this, however, the city pays sometimes the larger part of the pension for services from which it has benefited only indirectly.

It would put the practice on a sounder basis and restrict it to appointments of unquestionable advantage to the service, if at the time of employment of applicants a settlement of the accrued pension claim on account of credited outside experience were made by the payment of the required amount of a reserve into the pension fund.

Disability Pensions

Provision for disability incurred in performance of duty has limited application

Of primary importance in pension schemes which apply to hazardous occupations are the benefits provided for disabilities incurred in the performance of duty. It is to the best interest of the community that a

policeman, fireman or health officer should not be handicapped by the thought of consequences to himself or those dependent upon his support when his duties require deliberate exposure to the risk of life and limb. Similarly, the street cleaner who in the regular performance of duty is injured through no fault of his own is unquestionably entitled to the city's support.

The city's responsibility for such accidents is recognized in the pension funds of the police, fire, health and street cleaning departments by the omission of length of service requirements for eligibility to benefits when disability occurs. The benefits range from a minimum pension of $\frac{1}{4}$ of final salary to those injured immediately after entering the service to a maximum pension of $\frac{1}{2}$ of final salary after 20 years' service granted to policemen and the employees of the health department. Street cleaners receive a flat \$300 pension if disabled before having served 10 years, and not less than $\frac{1}{2}$ of final salary after a longer service. Firemen receive one-half of final salary without limitation of the number of years served. If they are partially disabled they are kept on the payroll on full pay performing whatever light duties are assigned to them. Their retirement on half-pay in the absence of special details can only be effected on their own consent.

The difference in the amount of pension accruing as a result of the same kind of risk indicates at a glance the lack of fair and impartial treatment. It is difficult to find justification for the grant to a disabled policeman of a one-quarter pay pension when a fireman under identical conditions may receive a benefit of one-half of his salary. Neither is it logical to restrict the pension of a disabled employee of the health department after 10 years and less than 20 years of service to an amount below one-half of his salary when a street cleaner disabled after the same number of years is entitled to a benefit of half-pay or more.

Length of service does not seem applicable as a basis for grading the amount of the benefit granted for disability incurred in the performance of duty. A liberal pension is as justifiable immediately after the employee has entered the department as it is after he has served a number of years. The one-half salary pension without regard to length of service appears to have more justification under these circumstances than under any other.

The main difficulty in the practical operation of provisions for disability in performance of duty is in preventing the application of the comparatively liberal benefits to disablements not incurred in the performance of duty. The present provisions do not define adequately the conditions under which these special benefits may be granted. Each of the frequently changing administrations of the departments concerned adopts its own method of interpretation, producing differences in results. An employee may be regarded as constructively on duty at all times, except when on leave of absence, and any health impairment or accident would entitle him to retire under the special benefit provisions. On the other hand, the benefits may be made available only to those who become disabled as a result of some specific act of duty.

The comparative importance of the provisions for disability incurred in

performance of duty, as separate features in the four pension schemes in which they are included is indicated to a certain degree by the following comparative statement¹ of pensioned employees on the rolls on June 30, 1914, and the number of those who retired under the special provisions discussed:

Pension Fund	Pensioned Employees on the Roll on June 30, 1914	Employees Pensioned Under Provisions for Disability Incurred in Performance of Duty		
		Number	Per Cent. of Total Pension Roll	Average Service (Years)
Police Pension Fund.....	2,716	113	4.16	7.58
Fire Department Relief Fund.....	899	88	9.79	13.98
Health Department Pension Fund.....	81	8	9.89	7.13
Department of Street Cleaning Relief and Pension Fund.....	321	6	1.87	10.33
Total.....	4,017	215	5.35	.....

The above figures probably understate the extent of disability incurred in the performance of duty. Employees disabled after having complied with the requirements for full pension on application retire as a rule on regular pensions and their pension records do not contain reference to disability. The comparatively short periods of average service shown in the statement indicate that in the majority of retirements disability and its cause was specified only when required to secure special benefits.

"Ordinary" disability provisions a separate feature of pension funds

"Ordinary" disability provisions, for the retirement of employees whose disability is not caused or induced by the performance of duty, cannot be based on a responsibility of the government for their support. Their justification is the necessity of preventing the continuation at full pay of employees who, though not superannuated, are, nevertheless, due to health impairment or accident, incapable of giving full return for compensation received.

The appeal against summary dismissal is powerful. Invalidity is a contingency of infrequent occurrence. It is generally not guarded against by the individual who, if he is prudent, has difficulty enough in taking care of the hazards of premature death and reduced earning power in old age.

¹ Compiled from Tables 40 to 43, pages 148 and 149, showing the distribution of pensioners retired for disability in performance of duty by years of service and age at appointment and retirement.

The consequences are distressing and the disaster especially pathetic when there is a family dependent on the employee's support.

In a service without a retirement system, those in authority, humanely enough, show a disposition to sacrifice the interests of the service for the sake of the individual. Where a retirement system is in operation but fails to cover cases of "ordinary" disability, the employee's theoretical right to a proportionate part of the "regular" pension lends the claim of justice to human sympathy.

A satisfactory solution of this phase of the problem demands consideration from a broad viewpoint. Preventive measures, such as adequate medical entrance examinations and an effective system of supervision of the health of employees while in active service, are of primary importance. But even an ideal preventive system does not eliminate the need for support in cases of unpreventable disabilities. Whether or not such support should take the form of a pension or be restricted to lump sum benefits, whether it should be graded according to length of service and extent of disability, are a few of the many questions which require a logical solution, to be followed up by effective legal and administrative safeguards against the unwarranted use of whatever benefit provisions are adopted.

Neither the introduction nor the subsequent development of the existing provisions for "ordinary" disability in the city's pension schemes have been preceded by an adequate consideration of principles of equity and good management. The predominant feature of the provisions is the privileged treatment accorded to groups of employees which is not justified by the requirements of their various service branches, and is explained by the readiness of past legislatures to enact any kind of a retirement bill desired by public employees and not actively opposed by the general public. Thus, as may be seen from the details of the "ordinary" disability provisions presented opposite page 12, the fireman may be pensioned the day after his entrance into the service, though disabled through accident or health impairment in no way contingent upon his official duties. The policeman and street cleaner must serve a minimum of 10 years before they are entitled to the same privilege. Twenty years is the minimum service requirement for disabled teachers, and employees of the health department and the Supreme Court, First Department; 25 years is the minimum for employees of the Supreme Court, Second Department. Finally, 30 years of service must stand to the credit of the employees covered by the provisions of the "Grady Law" before disability entitles them to a pension.¹ These minimum requirements are further reduced by the practice of allowing credit for "outside" experience, as explained in the statement referred to.

The following statement² contains a comparison of the number of employees pensioned on the ground of disability with the total number of pensioned employees who were on the rolls on June 30, 1914.

¹ Excepting Civil War veterans, who may be retired after 20 years of service.

² Compiled from Tables 44 to 50, pages 151 to 154, showing the distribution of "ordinary" disability pensioners by years of service and age at appointment and retirement.

Pension Fund	Pensioned Employees on the Rolls on June 30, 1914	Employees Pensioned Under "Ordinary" Disability Provisions		
		Number	Per Cent. of Total Pension Roll	Average Service
1. Police Pension Fund	2,716	1,752	64.51	21.23
2. Fire Department Relief Fund.....	899	229	25.47	15.71
3. Teachers' Retirement Fund	1,521	289	19.00	23.79
4. Health Department Pension Fund	81	.....	.....	.....
5. College of the City of New York Retirement Fund.....	4	.....	.....	.....
6. New York City Employees' ("Grady") Retirement Fund.....	106	106	100.00	34.02
7. Department of Street Cleaning Relief Pension Fund.....	321	294	91.59	16.59
8. Supreme Court, First Department, Retirement Fund.....	9	9	100.00	27.25
9. Supreme Court, Second Department, Retirement Fund.....	1	1	100.00	26.58
Total.....	5,658	2,680	47.37	.....

To illustrate further the extent to which retirements have been permitted under the main groups of existing benefit provisions, the following figures show the distribution of pensioned employees on the rolls on June 30, 1914, on the basis of reasons stated in retirement papers:

Provisions Under Which Employees Were Placed on Pension Roll	Number on Rolls June 30, 1914	Per Cent. of Total Roll
"Superannuation" (including "service," "service and age" and "superannuation" provisions).....	2,763	48.83
"Ordinary disability".....	2,680	47.37
"Disability in performance of duty".....	215	3.80
Total.....	5,658	100.00

The important point in the above data is the fact that 2,763 employees, or 48.83% of the total pension roll, were pensioned under optional retirement provisions, without proof of incapacity, while 2,895 employees, or 51.17%, were placed on the rolls on the basis of medical certificates of inability to perform their duties. It should be remembered that the actual cause of retirement does not always coincide with the reasons given in pension records. Until these are changed to show correct facts in each case, no distinct line of demarcation can be drawn between retirements for superannuation and the two forms of disability.

Preventive measures interlocked with disability problem

The presence of the large number of disability pensioners on the city's pension roll makes the problem of disability of great importance. Of the total annual pension charge of \$4,390,018.49 for former employees, on December 31, 1914, as shown on page 10, approximately \$2,000,000 is a charge for disability pensions. No doubt a large part of this sum is a legitimate charge as the retirement laws stand today. On the other hand, there is no question but that a proportion of this vast expenditure could be saved not only by a systematic revision of provisions for disability after it has occurred, but also by the institution of effective measures for its prevention. The importance of such preventive measures is by no means limited to considerations of a possible saving of dollars and cents. The conservation of the health of its employees is an obviously legitimate function of the city as a model employer.

The initial feature of a satisfactory preventive system is the requirement of an adequate medical examination of entrants into the service. In the police, fire and street cleaning departments, applicants for appointment are subject to thoroughgoing tests which safeguard these branches of the service from men unable to withstand the strain of their duties. The medical examination of applicants for teachers' licenses, on the other hand, is performed in a more or less perfunctory manner, regardless of the fact that teachers, mostly women, are subject to great nervous strain in their profession, a complaint repeatedly voiced by them and included among the major causes for retirement under the disability clause of their retirement fund. The medical tests for appointments to other occupations are varied, according to the rules established by the civil service commission. This phase of the problem is an especially difficult one. It requires continuous development on the part of the city's medical staff, and should be correlated with the medical studies on the basis of statistics which form an important part of the management of a sound pension system.

Supervision of the physical well-being of those admitted to the service is the next important function of the city government in this regard. The condition of employees receives a good deal of attention in the police and fire departments, where medical staffs of 24¹ and 10 surgeons, respectively, are charged with the medical supervision of the uniformed forces. In the street cleaning department, where the nature of the work subjects the rank and file to considerable physical strain and exposure to inclement weather, the importance of health supervision in the interest of both the city and the man is obvious. Its necessity is further emphasized by the limited income of the employee and his lack of knowledge of sanitation and precautions for his physical well-being. Notwithstanding these special conditions, the city has taken no remedial steps. The duties of the four² medical examiners of the street cleaning department are restricted to physical examinations of applicants for appointment and retirement and to purely disciplinary func-

¹ Reduced in 1916 budget to 20 surgeons, provision being made for full instead of part time service.

² Increased in 1916 to 8 medical examiners.

tions of verifying the correctness of reported sickness of employees. In other branches of the service, with the single exception of the health department, no measures whatever are taken to help the employee in properly safeguarding and conserving his health. The fact that good physical condition is an important requisite for the efficient performance of duty, and that money spent in its conservation is a good investment for the city, is entirely overlooked.

That a comprehensive and purposeful system of health supervision of the city's employees is desirable does not require much argument. The practical difficulties and limitations which must be met should not prevent the introduction of initial measures which should be developed in the light of future experience and study. As in the matter of medical entrance examinations of applicants, the city's functions with regard to the supervision of the health of its employees should be correlated with the medical work required in the operation of the disability features of its pension system.

Disability provisions inadequately safeguarded

Under the existing system, the problem of disability in active service is dealt with only after the employee has become incapacitated for the performance of his duty,¹ and the remedy is retirement on pension provided he has been in service the required number of years.

The successful application of these remedial retirement provisions depends on adequate safeguards, legal and administrative, against their unwarranted use. These safeguards must be established in the law as well as in the administrative machinery provided for its interpretation.

The law as it stands today gives a vague definition of what constitutes disability. "Permanent physical and mental disablement for the performance of duties" is, with slight variations in each of the city's pension schemes, the uncertain description of the condition of an employee which entitles him to retirement on his own initiative or at the instance of his superiors. This condition is supplemented in the police department by the restriction that the disability must not be the result of an employee's misconduct. In the police, fire, health and street cleaning departments the law requires, as a basis for the grant of pensions, the filing of a disability certificate made by a member of their respective medical staffs. In other funds such a stipulation is lacking. The law does not attempt to go any further into this complicated question. It leaves to the retiring authorities of each fund wide discretionary powers and the right and duty to establish such rules and regulations as are necessary for the correct interpretation of its provisions.

The retiring authorities are, therefore, handicapped at the very start by the difficult task of finding in the vague legal language a proper basis for adequate and practical regulations. This situation is aggravated by the wide latitude of administrative discretion. Frequent changes in departmental administrations make a continuous and purposeful development of

¹ In the fire, police and street cleaning departments measures have recently been inaugurated to encourage employees to maintain a sound physical condition.

an adequate system impossible. Such a system requires farsighted, patient study, in view of the fact that there are no satisfactory precedents either in this country or abroad. One of the first difficulties the retiring authorities have to deal with is the extent of an employee's disablement entitling him to a pension. This is a particularly troublesome problem in the police and fire departments, where strict physical standards regulate an employee's admission to the service. Shall the law be interpreted to mean that the policeman and the fireman must continue throughout his service in the same health and physical condition required at the time of his employment? Or, on the other hand, may he only be retired when his health has deteriorated to such a degree that he is unable to participate in an annual parade? An attempt to give the law the strictest interpretation would place the larger part of the two uniformed forces immediately on the pension roll. An over-cautious construction of its meaning would substantially decrease the average of efficiency in the active service of the two departments. Another difficult question is the permanency of disability stipulated by the present law. In the majority of instances it is impossible to predict the duration of health impairment. Often the temporary character of a disease or injury is obvious, and all that is needed for the restoration of the employee's health is an opportunity for rest and proper medical care. Yet, within the meaning of the present law, such an opportunity by means of temporary retirement on a modest pension may not be given. And even if the disability be permanent, but partial, transfer to other kinds of work required by the city could be made, without recourse to pension and with but slight alteration of the employee's earnings.

The efficacy of the practice of retirement for disability, under the present vague law and indefinite responsibility of retiring authorities, depends on the validity of the certification of incapacity of an employee entitling him to retirement, and the subsequent steps taken to ascertain that the disability for which the employee was retired still exists and entitles him to continued support.

The certification of disability for the retirement of employees from departments covered by the "Grady Law" is made by a board of physicians not administratively responsible to the heads of these departments. The possibility of undue influence or a tendency on the part of physicians to approach their task of examination with a preconceived judgment is avoided. The value of disability certificates issued by physicians of the departments from which an employee is to be retired is somewhat reduced by the possibility of compulsion which may be exercised by department heads who have full appointive and dismissal rights over their medical staffs. This disqualifying consideration applies to the departments of police, fire, health and street cleaning. Of little or no value is the certification of disability by private physicians who are paid for their work by the applicant. Such certificates are admitted as a basis for retirement from the pension funds of the department of education and the Supreme Courts, First and Second Departments.

Administrative control of disabled employees after they have once been placed on the pension roll is not directly dealt with in existing retirement laws. The right of retiring authorities to subject disability pensioners to medical examinations may be found, at least by implication, in the legal provisions conferring discretionary powers for the granting and revocation of disability pensions. No measures have been taken to lend practical meaning and force to this logical, if only implied, right of restriction of disability benefits to those who are entitled to them on account of continued health impairment. The desirability of revising existing disability pension rolls by means of periodical medical examinations is obvious especially in the following pension funds, as indicated by the large number of disability pensioners and their comparatively low present average ages and the ages at which they retired:

Pension Fund	Number of "Ordinary Disability" Pensioners on June 30, 1914	Average Age	
		At Retirement	On June 30, 1914
Police Pension Fund.....	1,752	48.60	53.67
Fire Department Relief Fund.....	229	44.30	48.90
Teachers' Retirement Fund:			
Men.....	11	54.82	57.00
Women.....	278	48.39	51.83
Total.....	2,270	.....	.....

Disability provisions illogical and inequitable

The discussion of legal and administrative handicaps to an effective enforcement of existing benefit provisions emphasizes the following criticism of the provisions themselves.

The difference in the minimum service period entitling an employee to retirement for ordinary disability from the various funds, as shown in the chart opposite page 12, is an obviously awkward arrangement. It not only subjects the present system to just criticism of unwarranted discrimination, but leaves branches of the service not covered by adequate disability provisions open to the undesirable effect of administrative makeshift arrangements for carrying a man on the payroll until he becomes eligible to retirement. It is hard to say what the proper minimum service requirement for disability benefits should be. In the large majority of foreign pension schemes, both for civil service and industrial employees, the service period for pension has been, so far, reduced to a minimum of 10 years. Return of contributions in contributory schemes and lump sum benefits in straight pension plans are not infrequent methods of dealing with the problem of disability when it occurs after a shorter service. Pension funds in this country treat the disability problem in an offhand manner and do not offer satisfactory precedents.

Since the risk of invalidity is present at any time and the consequences of its occurrence during the earlier years of service of an employee are most distressing, eligibility to benefits regardless of length of service would seem desirable. The infrequency of invalidity at earlier ages and the reduced longevity of pensioners whose health is impaired make bona fide retirements a comparatively inexpensive feature. The serious administrative difficulties in safeguarding such a measure, however, are probably the main reasons which have prevented its introduction.

The amounts of pension granted from various funds in cases of disability retirement are not controlled by the uniform application of a carefully determined principle. Though the need for invalidity provisions is present at any stage of employment, considerations of equity require the grading of the amount of pension in accordance with length of service. This principle is recognized in the teachers' retirement fund, which pays to teachers disabled after a service of from 20 to 30 years, a pension of $\frac{1}{60}$ of the final salary for each year of service. In the police pension fund, the law allows the payment of $\frac{1}{4}$ to $\frac{1}{2}$ of final salary per annum for disability occurring after a service of from 10 to 20 years. It leaves, however, the determination of the exact amount to be granted within these limits to the discretion of the police commissioner. A disabled fireman with less than 10 years' service is entitled to $\frac{1}{3}$ of final salary. After 10 years', and less than 20 years' service, a flat pension of not more than $\frac{1}{2}$ of salary is granted. After the completion of the 20-year service period, the minimum pension granted is $\frac{1}{2}$ of final salary and may exceed this amount if the fire commissioner so directs. The minimum pension granted to a disabled street cleaner is $\frac{1}{2}$ of final salary after 10 years of service. In other pension funds the pension scale and service requirements for compulsory retirement for disability are identical with those applicable to voluntary retirement. One exception is the retirement fund of the College of the City of New York which has no provision for disability. Another is the New York City Employees' (Grady) Retirement Fund, the benefits of which are entirely restricted to cases of disability and are limited to not exceeding $\frac{1}{2}$ of the average salary of the three years preceding retirement.

Due to the far-reaching and costly consequences of its operation one feature of the present disability provisions requires special emphasis. In the pension funds of the police, fire and street cleaning departments, reduced service requirements without correspondingly reduced amounts of benefits granted for ordinary disability create a strong inducement for early retirement. A policeman must wait until he has completed 25 years of service and has reached the age of 55 before he is entitled to optional retirement at $\frac{1}{2}$ final salary. A service of only 20 years without age limitation puts the same amount of pension within his reach if he is certified as disabled for the performance of duty. In the fire and street cleaning departments, the inducement for early retirement lies in the fact that the same pension of one-half final salary is granted after 10 years of service if disabled, as is available on application after 20 years of service.

These ill-considered disability provisions provide the main explanation of the high percentage of disability pensioners on the rolls of these three pension funds. As shown on page 26, disabled policemen formed 64.51% of the total pension roll of the police pension fund on June 30, 1914. In the fire department relief fund, the percentage was 25.47%, and in the fund of the street cleaning department it reached 91.59%. An additional contributing factor to the high percentage of disabled street cleaners is the fact that due to their entering the department late in life they are superannuated before having served 20 years and are retired in great numbers, voluntarily and compulsorily, under the 10-year disability provision.

Discretionary Excess Benefits and Re-employment of Pensioners by City

Discretionary excess pensions and the re-employment of pensioners in city departments are special features in the operation of present provisions which apply as well to the retirement of superannuated and disabled employees and require special mention as they illustrate most effectively the inconsistency and unfairness of the city's pension system.

Discretionary excess benefits invite favoritism

Members of the Hunter College staff and the president and professors of the College of the City of New York are given the privilege of retirement on pensions in excess of the $\frac{1}{2}$ of final salary maximum granted to practically the entire remainder of the service. The fact that this privileged treatment of a small section of the service is regulated by definite provisions of law does not, of course, justify its existence, though it restricts the well-founded criticism of favoritism to the law itself, the administration having no choice in the matter.

Of much greater harm to the morale of the service is the extension of special favors to individual employees in the discretion of retiring authorities. This is made possible in the police, fire and street cleaning departments by the language of the law, requiring the pensions granted under certain provisions to be "not less than" one-half the employee's terminal salary. While in the police department no special meaning was given to this language, the commissioners of the fire and street cleaning departments interpreted it as a discretionary right to grant excess pensions. The details of the retirement on such excess pensions of 29 employees of the two departments are presented in the following tabulation:

**EXCESS BENEFITS GRANTED TO EMPLOYEES IN THE DISCRETION OF
HEADS OF DEPARTMENTS**

No.	Rank	Date at Retirement	Commissioner Who Granted Pension	Reason Given for Excess Pension	Salary at Date of Retirement	Annual Pension	Excess Pension Over One-half Salary	Years of Service	Age at Retirement
FIRE DEPARTMENT RELIEF FUND									
1	Deputy Chief	12/ 1/1903	Sturges	Not Given	\$4,200.00	\$3,000.00	\$900.00	24	49
2	Deputy Chief ¹	1/ 1/1910	Hayes	Not Given	4,200.00	2,500.00 ¹	400.00	42	70
3	Captain	3/ 1/1910	Waldo	Disability	2,160.00	1,666.66	586.66	38	60
4	Captain	4/ 1/1910	Waldo	Disability	2,160.00	1,666.66	586.66	28	50
5	Engineer ¹	5/ 1/1910	Waldo	Disability	1,600.00	1,066.66 ¹	266.66	20	49
6	Captain	7/13/1910	Waldo	Disability	2,500.00	1,666.66	416.66	20	49
7	Fireman	7/14/1910	Waldo	Disability	1,400.00	933.33	233.33	20	47
8	Fireman	9/ 1/1910	Waldo	Disability	1,400.00	933.33	233.33	27	54
9	Captain	1/ 1/1911	Waldo	Disability	2,500.00	2,500.00	1,250.00	40	61
10	Captain	2/ 1/1911	Waldo	Not Given	2,500.00	1,666.66	416.66	38	63
11	Fireman ¹	2/ 1/1911	Waldo	Not Given	1,400.00	933.33 ¹	233.33	29	62
12	Fireman	3/ 1/1911	Waldo	Disability	1,400.00	1,050.00	350.00	21	49
13	Captain ¹	3/ 1/1911	Waldo	Disability	2,500.00	1,666.66 ¹	416.66	30	57
14	Captain	4/ 7/1911	Waldo	Disability	2,500.00	1,666.66	416.66	20	43
15	Chief of Dept.	5/ 1/1911	Waldo	Not Given	10,000.00	6,000.00	1,000.00	27	48
16	Deputy Chief	7/ 7/1911	Waldo	Meritorious Service	4,200.00	4,200.00		38	61
17	Captain	10/23/1913	Johnson	Disability	2,500.00	2,000.00	750.00	21	44
18	Chief of Battalion	12/24/1913	Johnson	Meritorious Service	3,300.00	3,000.00	1,350.00	23	45
19	Captain	12/24/1913	Johnson	Not Given	2,500.00	1,666.66	416.66	43	67
20	Engineer	12/24/1913	Johnson	Not Given	1,600.00	1,066.66	266.66	44	66
21	Deputy Chief	12/30/1913	Johnson	Not Given	4,200.00	3,150.00	1,050.00	24	45
22	Deputy Chief	12/30/1913	Johnson	Not Given	4,200.00	2,800.00	700.00	28	50
23	Deputy Chief	12/30/1913	Johnson	Not Given	4,200.00	2,800.00	700.00	29	57
24	Chief of Battalion	12/31/1913	Johnson	Not Given	3,300.00	2,200.00	550.00	29	52
25	Captain	8/18/1914	Adamson	Disability	2,500.00	2,500.00	1,250.00	23	47
26	Chief of Battalion	2/ 1/1915	Adamson	Meritorious Service	3,300.00	2,200.00	550.00	44	66
Total....					\$78,220.00	\$56,499.93	\$17,389.93		

¹ Deceased pensioner.

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

1	Asst. Genl. Supt. ¹	2/16/1913	Edwards	Disability	\$2,500.00	\$1,500.00 ¹	\$250.00	19½	62
2	Genl. Supt.	2/16/1913	Edwards	Not Given	3,000.00	1,800.00	300.00	32	67
3	Dist. Supt., Acting Genl. Supt.	12/ 8/1913	Edwards	Disability	3,000.00	1,800.00	300.00	18	47
Total....					\$8,500.00	\$5,100.00	\$350.00		

¹ Deceased pensioner.

An inquiry into the records of the 26 employees retired from the fire department leads to the conclusion that with few exceptions official discretion was based on considerations other than those of extraordinary injury or merit. The statement referred to brings out the following significant features:

- 1 Out of 26 excess pensioners, only 4 are firemen. The remaining 22 are higher officers whose pensions at half-pay would have been ample to maintain them in comfortable circumstances.
- 2 No special justification for excess pensions to 11 pensioners, such as injury or special merit, was specified in the records, nor could any be discovered through investigation.

- 3 A chief of the department (case No. 15) was retired by Commissioner Waldo in good health at age 48 at a pension of \$6,000, the highest amount ever granted by the city—reason not given.
- 4 A pension of \$3,150, 75% of his salary of \$4,200, was granted by Commissioner Johnson to a deputy chief (case No. 21). He retired in the prime of life—at age 45—after a service of 24 years in the department and less than 20 years in the fire-fighting force.
- 5 The same commissioner, during the last week of his administration, retired 6 high officials of the department (cases 19 to 24) at more than half-pay, without any apparent reason for special consideration.

The circumstances surrounding the grant of excess pensions by Commissioner Edwards of the street cleaning department are equally significant. All three beneficiaries were the highest paid officers of the uniformed force. Two of them had a service of less than 20 years, and their retirement could be effected only on the ground of disability not caused in the performance of duty. The last-mentioned pensioner in the statement (case No. 3) was promoted, pending a promotion examination, from a salary of \$2,100 to \$3,000 during the same year in which he was retired. His pension of \$1,800 shows the costly results of the final salary basis, as well as of administrative discretion in fixing the amount of pension.

Simultaneous payment of pension and salary an unjustifiable practice

An expensive and demoralizing consequence of the separate, unrelated existence of the nine pension funds is the retirement of employees on pension from one department and their subsequent employment by another. Two phases of the retirement problem are involved in this practice. In the first place an employee who is superannuated or otherwise disabled for the work required in one department is not necessarily incapacitated for the efficient performance of duties in another branch of the government. The advisability of an effective system of transfers of employees between departments is obvious. It is properly a function of the civil service commission and the bureau of standards of the board of estimate.

The second phase of the problem is the propriety of paying a pension for previous work while the pensioner is on the active payroll. The prospective combined income from pension and salary which such a practice offers is a strong inducement for early retirement. And after a pensioner has been readmitted to the service, his final elimination when superannuated or disabled is complicated by his claim, however unjust, for another pension for additional service.

The natural remedy for the present illogical condition is the suspension of payment of pension while the pensioner is in active service. This is impracticable until new legislation is secured, as the present charter provision (Section 1560), which prohibits the employment of pensioners in city departments, has been held by the courts to be unconstitutional. Future constructive legislation should encourage transfers of employees to other branches

of the service, and permit the payment of pensions only upon final retirement but with credit for the entire service.

The details of the re-employment of pensioned policemen and firemen as brought out by the results of the census of municipal employees taken on June 30, 1914, are presented in the four statements on pages 36 to 43. On that date 29 pensioned policemen and 27 pensioned firemen were holding positions in other city departments. Their combined annual income in pension and salary was as follows:

	Annual Pension	Annual Salary	Combined Pension and Salary
29 Pensioned Policemen	\$22,004.00	\$34,425.00	\$56,429.00
27 Pensioned Firemen	24,273.33	30,968.00	55,241.33
Total	\$46,277.33	\$65,393.00	\$111,670.33

In addition to pensioners who were in the city's service on June 30, 1914, the statements referred to show 18 pensioned policemen and 7 pensioned firemen who were employed in other departments and had withdrawn from the service prior to that date. Their combined annual income in pension and salary was as follows:

	Annual Pension	Annual Salary	Combined Pension and Salary
18 Pensioned Policemen	\$12,930.00	\$15,584.50	\$28,514.50
7 Pensioned Firemen	6,680.00	6,026.50	12,706.50
Total	\$19,610.00	\$21,611.00	\$41,221.00

POLICE PENSION FUND—

No.	Nature of Retirement	Rank	Combined Income From City		
			Annual Pension	Annual Salary	Total Income
			Pensioners in the City's		
1	Disability in performance of duty	Doorman	\$300.00	\$1,200.00	\$1,500.00
2	Disability	Lieutenant	1,125.00	1,500.00	2,625.00
3	Disability	Patrolman	700.00	757.50 ¹	1,457.50
4	Disability	Patrolman	358.00	600.00	958.00
5	Disability	Lieutenant	921.00	2,000.00	2,921.00
6	Disability	Lieutenant	1,125.00	1,500.00	2,625.00
7	Disability	Patrolman	700.00	1,500.00	2,200.00
8	Disability	Patrolman	700.00	1,500.00	2,200.00
9	Disability	Patrolman	700.00	1,400.00	2,100.00
10	Disability	Sergeant	875.00	1,200.00	2,075.00
11	Disability	Patrolman	700.00	750.00	1,450.00
12	Disability	Patrolman	700.00	1,460.00 ²	2,160.00
13	Disability	Patrolman	700.00	1,500.00	2,200.00
14	Disability	Patrolman	700.00	1,200.00	1,900.00
15	Disability	Patrolman	700.00	900.00	1,600.00
16	Disability	Sergeant	875.00	720.00	1,595.00
17	Disability	Patrolman	700.00	757.50 ¹	1,457.50
18	Disability	Sergeant	875.00	1,200.00	2,075.00
19	Disability	Patrolman	700.00	900.00	1,600.00
20	Disability	Doorman	500.00	600.00 ³	1,100.00
21	Disability	Lieutenant	1,125.00	1,200.00	2,325.00
22	Disability	Lieutenant	1,000.00	1,800.00	2,800.00
23	Service	Patrolman	700.00	180.00	880.00
24	Service	Lieutenant	1,125.00	1,500.00	2,625.00
25	Service	Sergeant	1,000.00	900.00	1,900.00
26	Service	Patrolman	700.00	2,400.00	3,100.00
27	Service	Patrolman	700.00	900.00 ⁴	1,600.00
28	Service	Doorman	500.00	1,500.00	2,000.00
29	Service	Doorman	500.00	900.00	1,400.00
	Total		\$22,004.00	\$34,425.00	\$56,429.00

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Paid diem rate; salary estimated on the basis of 240 working days. ³ Paid at a per diem rate;

PENSIONED POLICEMEN IN THE CITY'S SERVICE

Age at Date of Retirement	Service in Police Dept.		Service of Pensioner in Other Dept.		Department Employing Pensioner	In What Capacity
Service on June 30, 1914						
58	Yrs. 5	Mos. 8	Yrs. 20	Mos. ..	Pres. Boro. of Brooklyn	Inspector of Sewer Connections
49	20	..	1	5	Court, Municipal	Court Attendant
52	22	5	{ 2	3	Water Supply, Gas & Elec.	Laborer
35	10	3	{ ..	2	Pres. Bor. of Bronx	Clerk
44	16	4	{ 2	10	Water Supply, Gas & Elec.	
42	20	1	{ ..	6	Tenement House	County Detective
49	28	10	{ 3	7	District Attorney, Queens	Court Attendant
54	29	..	{ 3	4	Court, County, Queens	Court Attendant
49	21	3	{ 1	6	Court, County, Bronx	Court Attendant
53	22	11	{ 1	6	Court, Magistrates	Process Server
45	20	8	{ 2	3	Court, Municipal	Examiner
50	21	2	{ 6	3	Court, Special Sessions	Clerk
48	20	6	{ 2	4	Law, Brooklyn	Stable Foreman
52	23	9	{ 1	5	Law, Manhattan	
44	22	10	{ ..	6	Parks, Brooklyn	Court Attendant
46	20	2	{ ..	6	Court, Magistrates	
45	20	..	{ 4	10	Court, City	Examiner
43	19	6	{ 1	7	Law	Attendant
48	24	8	{ ..	3	Public Service Commission	
54	20	10	{ ..	5	Docks & Ferries	Laborer
43	21	7	{ ..	6	Pres. Boro. of Manhattan	Court Attendant
46	24	6	{ ..	1	Parks, Bronx	Court Attendant
55	25	1	{ 1	9	Court, Magistrates	Caretaker
59	38	3	{ 2	6	Court, Supreme	Court Attendant
57	30	9	{ 9	4	Brooklyn Public Library	Messenger
49	20	..	{ 18	..	Court, Magistrates	Chief Examiner
58	33	1	{ 7	11	Court, Special Sessions	Foreman
63	9	8	{ 3	9	Tenement House	Court Attendant
72	21	2	{ ..	6	Law	Messenger
					Pres. Boro. of Bronx	
					Pres. Boro. of Brooklyn	
					Court, Special Sessions	
					Education	

at a per diem rate; salary estimated on the basis of 365 working days. * Paid at a per salary estimated on the basis of 225 working days.

POLICE PENSION FUND—

No.	Nature of Retirement	Rank	Combined Income from City		
			Annual Pension	Annual Salary	Total Income
Pensioners who were in the City's Service During					
30	Disability	Patrolman	\$614. 00	\$757. 50 ¹	\$1,371. 50
31	Disability	Sergeant	750. 00	1,000. 00	1,750. 00
32	Disability	Patrolman	660. 00	757. 50 ¹	1,417. 50
33	Disability	Patrolman	700. 00	1,200. 00	1,900. 00
34	Disability	Sergeant	1,000. 00	1,000. 00	2,000. 00
35	Disability	Patrolman	631. 00	1,200. 00	1,831. 00
36	Disability	Patrolman	700. 00	900. 00	1,600. 00
37	Disability	Patrolman	700. 00	1,000. 00	1,700. 00
38	Disability	Patrolman	600. 00	900. 00	1,500. 00
39	Disability	Patrolman	700. 00	360. 00	1,060. 00
40	Disability	Patrolman	400. 00	757. 50 ¹	1,157. 50
41	Disability	Lieutenant	1,000. 00	626. 00 ²	1,626. 00
42	Service	Patrolman	600. 00	1,200. 00	1,800. 00
43	Service	Patrolman	700. 00	900. 00	1,600. 00
44	Service	Captain	1,375. 00	900. 00	2,275. 00
45	Service	Patrolman	600. 00	626. 00 ²	1,226. 00 ¹
46	Service	Patrolman	700. 00	600. 00	1,300. 00
47	Service	Doorman	500. 00	900. 00	1,400. 00
Total			\$12,930. 00	\$15,584. 50	\$28,514. 50

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Ap-Manhattan, at \$900 per annum. ³ Paid at a per diem rate; salary estimated on the basis

PENSIONED POLICEMEN IN THE CITY'S SERVICE—Continued

Age at Date of Retirement	Service in Police Dept.		Service of Pensioner in Other Dept.		Department Employing Pensioner	In What Capacity	
Period January 1, 1908 to June 30, 1914							
44	Yrs.	Mos.	Yrs.	Mos.	Docks & Ferries ^a	Attendant	
49	17	7	..	3	Fire	Lineman	
41	21	2	..	1	Docks & Ferries	Laborer	
49	18	9	1	1	Court, Magistrates	Probation Officer	
45	26	8	1	4	District Attorney, Kings	Process Server	
46	20	1	1	9	Mayoralty	Inspector	
44	18	..	..	3	Pres. Boro. of Man.	Attendant
44	20	5	{	..	Pres. Boro. of Man.		
44	20	8		..	2	Pres. Boro. of Bronx	
51	16	9		4	10	Sheriff, New York County	
53	27	9	1	..	Sheriff, Queens	Keeper [Sheriff	
41	11	3	7	3	Correction	Assistant Deputy	
47	20	2	1	3	Pres. Boro. of Bronx	Hospital Helper	
46	20	1	9	3	Board of Water Supply	Laborer	
59	34	6	4	1	Pres. Boro. of Brooklyn	Laborer	
62	23	3	..	4	Education	Inspector Sewer Construction	
56	27	6	..	6	Board of Water Supply	Clerical Assistant	
48	20	2	2	11	Water Supply, Gas & Elec.	Patrolman	
66	11	..	5	6	Education	Laborer	
					Bridges	Cleaner	
						Bridge Tender	

pointed (July 1, 1914) after the taking of census as attendant in office of Pres. Boro. of of 313 working days. ²Pension and salary terminated simultaneously by death.

FIRE DEPARTMENT RELIEF FUND—

No.	Nature of Retirement	Rank	Combined Income from City		
			Annual Pension	Annual Salary	Total Income
Pensioners in the City's					
1	Disability in performance of duty	Fireman.....	\$700.00	\$757.50 ¹	\$1,457.50
2	Disability in performance of duty	Fireman.....	700.00	1,800.00	2,500.00
3	Disability in performance of duty	Fireman.....	700.00	1,125.00 ²	1,825.00
4	Disability	Foreman.....	1,250.00	1,800.00	3,050.00
5	Disability	Asst. Foreman..	900.00	1,200.00	2,100.00
6	Disability	Foreman.....	1,080.00	1,200.00	2,280.00
7	Disability	Fireman.....	700.00	900.00	1,600.00
8	Disability	Fireman.....	700.00	757.50 ¹	1,457.50
9	Disability	Fireman.....	600.00	900.00	1,500.00
10	Service.....	Captain.....	1,080.00	900.00 ³	1,980.00
11	Service.....	Fireman.....	700.00	757.50 ¹	1,457.50
12	Service.....	Chief of Battalion	1,650.00	1,500.00	3,150.00
13	Service.....	Captain.....	1,250.00	1,500.00	2,750.00
14	Service.....	Foreman.....	1,250.00	1,500.00	2,750.00
15	Service.....	Foreman.....	1,250.00	1,200.00	2,450.00
16	Service.....	Engineer of Steamer.....	800.00	1,200.00	2,000.00
17	Service.....	Fireman.....	700.00	1,125.00 ²	1,825.00
18	Service.....	Foreman.....	1,080.00	1,500.00	2,580.00
19	Service.....	Fireman.....	700.00	1,460.00 ³	2,160.00
20	Service.....	Fireman.....	700.00	757.50 ¹	1,457.50
21	Service.....	Engineer.....	800.00	1,500.00 ⁴	2,300.00
22	Service.....	Foreman.....	1,250.00	1,200.00	2,450.00
23	Service.....	Fireman.....	600.00	757.50 ¹	1,357.50
24	Service.....	Fireman.....	700.00	909.00 ¹	1,609.00
25	Service.....	Fireman.....	700.00	1,095.00 ³	1,795.00
26	Service.....	Fireman.....	933.33 ⁴	757.50 ¹	1,690.83
27	Service.....	Engineer of Steamer.....	800.00	909.00 ¹	1,709.00
Total.....			\$24,273.33	\$30,968.00	\$55,241.33

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Paid at rate; salary estimated on the basis of 365 working days. ³ Receives a salary of \$4,860, out

PENSIONED FIREMEN IN CITY'S EMPLOY

Age of Pensioner at Date of Retirement	Service in Fire Dept.		Service of Pensioner in Other Dept.		Department Employing Pensioner	In What Capacity
Service on June 30, 1914						
	Yrs.	Mos.	Yrs.	Mos.		
40	12	6	10	..	Parks, Bronx	Laborer
39	7	4	7	9	Water Supply, Gas & Electricity, Brooklyn	Foreman
46	17	5	10	..	President Borough of Bronx	Paver
37	12	5	1	2	Fire	Inspector
34	10	3	1	2	Fire	Inspector
39	11	2	5	1	Health	Inspector
40	12	6	..	1	Sheriff, Queens	Deputy Sheriff
67	39	..	2	3	Parks, Brooklyn	Laborer
46	15	7	9	5	President Borough of Brooklyn	Watchman
54	25	5	{	3	Bridges	Bridge Tender
				3	Street Cleaning	Harness Maker
66	34	2	3	7	President Borough of Bronx	Laborer
48	20	4	1	2	Fire	Inspector
49	24	5	1	2	Fire	Inspector
44	20	2	1	2	Fire	Inspector
46	20	1	1	2	Fire	Inspector
46	20		1	1	Fire	Inspector
43	20	1	{	5	Parks, Bronx	Paver
				4	President Borough of Bronx	
45	20	1	1	2	Fire	Inspector
43	21	6	7	1	Parks, Brooklyn	Foreman Painter
50	20	5	2	1	Parks, Bronx	Laborer
49	24	1	17	9	Education	Janitor
47	24	11	{	3	Tenement House	Inspector
				2	Health	
54	25	9	16	..	Docks & Ferries	Laborer
51	23	2	4	10	Water Supply, Gas & Electricity, Richmond	Mason's Helper
50	20	4	3	4	National Guard	Laborer
54	26	8	2	6	President Borough of Bronx	Laborer
54	30	9	..	6	President Borough of Bronx	Licensed Fireman

a per diem rate; salary estimated on the basis of 225 working days. * Paid at a per diem of which assistants are paid. * Pension is excess of \$233.33 over one-half final salary.

FIRE DEPARTMENT RELIEF FUND—

No.	Nature of Retirement	Rank	Combined Income from City		
			Annual Pension	Annual Salary	Total Income
<i>Pensioners Who Were in the City's Service</i>					
28	Disability	Foreman	\$1,250.00	\$1,200.00	\$2,450.00
29	Disability	Foreman	1,250.00	720.00	1,970.00
30	Service	Asst. Foreman ..	900.00	1,060.50 ¹	1,960.50 ²
31	Service	Foreman	1,080.00	900.00	1,980.00
32	Service	Fireman	700.00	782.50 ²	1,482.50
33	Service	Fireman	700.00	757.50 ¹	1,457.50
34	Service	Engineer of Steamer	800.00	606.00 ¹	1,406.00
	Total .....	.....	\$6,680.00	\$6,026.50	\$12,706.50

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Pension mated on the basis of 313 working days.

PENSIONED FIREMEN IN CITY'S EMPLOY—Continued

Age of Pensioner at Date of Retirement	Service in Fire Dept.		Service of Pensioner in Other Dept.		Department Employing Pensioner	In What Capacity
<i>During Period January 1, 1908 to June 30, 1914</i>						
44	Yrs. 18	Mos. 10	Yrs. 1	Mos. ..	Fire	Inspector
41	11	2	..	4	President Borough of Manhattan	Typewriting Copyist
51	22	11	3	4	Docks & Ferries	Dock Builder
43	20	8	4	1	Education	Janitor
47	20	4	..	1	Water Supply, Gas & Electricity	
			4	4		
					President Borough of Manhattan	Foreman
53	24	1	..	2	Docks & Ferries	Laborer
49	20	2	..	10	President Borough of Bronx	Laborer

and salary terminated simultaneously by death. * Paid at a per diem rate; salary esti-

A detailed study of the statements presented brings out a multitude of significant features among which are the following:

Statement of police pensioners in city's service:

1. Of the 47 pensioners, 28 retired before they were 50 years old.
2. The combined salary and pension of 37 pensioners exceeds substantially the pay they were receiving for active duty on the date of retirement, and brings up the question whether pensions are intended to assure a more comfortable existence after retirement than was possible by the pensioner's best efforts in his prime.
3. 34 pensioners were retired because of disability. 8 were subsequently employed as laborers and have held their positions for various periods up to 18 years. The correctness of their disability certificates or the propriety of their subsequent appointments should be questioned.
4. Pensioner No. 1 has been drawing a pension and a salary for 20 years. He served for the police department 5 years and 8 months. In 1914, he applied for another pension under the "Grady Law," which permits the retirement of Civil War Veterans after 20 years service. The Board of Estimate denied his application.
5. Pensioners Nos. 20 and 26 retired 19 and 18 years ago, respectively, after services of 20 years in the department. They have since been receiving a pension and a salary from the city. Pensioner No. 26, now an examiner in the law department, receives a pension of \$700 and a salary of \$2,400.

Statement of pensioned firemen in city's service:

1. Of the 34 pensioners, 23 retired before they were 50 years old and 4 retired below age 40.
2. 26 pensioners substantially bettered themselves financially, the combined pension and salary exceeding their active pay at date of retirement.
3. 3 pensioners (cases Nos. 1, 2 and 3), who were retired for permanent disability incurred in the performance of duty, after a service of from 7 to 17 years, were subsequently employed as laborers and held their positions for 7 to 10 years.
4. 9 pensioners were re-employed by the same department as inspectors of the fire prevention bureau.
5. A fireman (case No. 23), pensioned 16 years ago at age 54, after a service of 25 years and 9 months, has been employed continuously since retirement as a laborer in the department of docks and ferries, and is at present 70 years old.

Pensions to Dependents of Employees

Four of the nine pension schemes provide support to dependents

In four of the city's pension schemes provision is made for the support of dependents of deceased employees. The details are set forth in the chart opposite page 12.

The extent of the application of these provisions is indicated by the proportion of pensioned dependents on the rolls of the four pension funds on June 30, 1914.¹ It must be kept in mind that the funds have been in existence for a varying number of years, those longest in operation having developed a more normal ratio of pensioned dependents than funds recently established.

¹ Statement compiled from tables 25, 26, 28, 28a and 31, pages 133 to 140.

Pension Fund	Year Fund Was Established	Pensioned Employees on the Rolls on June 30, 1914	Pensioned Dependents of Employees on the Rolls on June 30, 1914				
			Total	Per Cent. of Pensioned Employees	Widows	Children ¹	Dependent Parents
Police Pension Fund...	1857	2,716	1,566	57.7	1,441	124	1
Fire Department Relief Fund.....	1871	899	787	87.5	669	70	48
Health Department Pension Fund....	1894	81	12	14.8	10	1	1
Department of Street Cleaning Relief and Pension Fund.....	1911	321	116	36.1	106	7	3
Total.....	....	4,017	2,481	61.8	2,226	202	53

The comparative annual financial burden imposed by the above indicated pensions to dependents of employees is shown in the following statement:²

Pension Fund	Total Annual Pension Charge, December 31, 1914	Annual Charge for Employees' Pensions	Annual Charge for Dependents' Pensions	
			Amount	Per Cent. of Employees' Pensions
Police Pension Fund.....	\$2,461,528.55	\$2,006,250.55	\$455,278.00	22.7
Fire Department Relief Fund.....	1,065,939.73	804,469.73	261,470.00	32.5
Health Department Pension Fund.....	80,307.50	76,707.50	3,600.00	4.7
Department of Street Cleaning Relief and Pension Fund.....	170,216.50	141,416.50	28,800.00	20.4
Total.....	\$3,777,992.28	\$3,028,844.28	\$749,148.00	24.7

Dependents of those killed or injured in performance of duty inadequately protected.

The principle of the city's responsibility for the support of the widows, children and dependent parents of employees killed or dying as a result of injuries received in the performance of duty is recognized in all four pension funds. The benefits granted vary, however, in amount and confer privileged treatment on groups of employees not enjoyed by others.

¹ One or more children of an employee considered as one unit.

² Compiled from tables 22, 23 and 24, opposite page 130.

The widow of a policeman is allowed a pension which *must not exceed \$600 per annum*. The fireman's widow under identical conditions receives one-half of her deceased husband's salary, the pension being limited, however, to *not less than \$600 nor more than \$1,000 per annum*. The pensions of widows of street cleaners and employees of the Health Department are limited to a flat amount of \$300 per annum. Similar discrimination in favor of firemen and policemen is shown in the higher benefits granted to their children or parents. One-half of the fireman's salary may be granted to his children or dependent parents not exceeding, however, \$500 per annum to each beneficiary. The benefits to a policeman's children or parents are restricted, in total, to \$600 per annum. The pensions available under the provisions of the Health and Street Cleaning funds are \$300 and \$200 per annum, respectively.

With the possible exception of the provisions of the Fire and Police department funds, the benefits are obviously inadequate and in most instances replace but a fraction of the financial loss to the dependents of an employee who lost his life in the city's service. Added to the inadequacy of the benefits is their uncertainty. *Not only has the commissioner of the department the right to decide whether or not a pension shall be given, but each of his successors may disagree with his decision and revoke or amend the pension according to his interpretation of the law.*

It is also important to correct the popular misconception that the majority of pensions are granted to the dependents of those killed or dying from injuries received in the performance of duty. As a matter of fact, these, though the most legitimate benefits, form a very small proportion of benefits to dependents. Only a fraction of the total number of dependents on the rolls on December 31, 1914, were in receipt of pensions granted on account of the death of employees due to the hazards of their occupation. This is shown in the following statement:¹

Pension Fund	Pensioned Dependents of Employees on the Rolls on December 31, 1914	Dependents of Employees Killed in the Performance of Duty		
		Range of Benefits, Per Annum	Number	Per cent. of Total Roll
Police Pension Fund.....	1,529	\$450 to \$600 ²	31	2.0
Fire Department Relief Fund.....	775	\$350 to \$1,500	77	9.9
Health Department Pension Fund.....	12	\$300	12	100.0 ³
Department of Street Cleaning Relief and Pension Fund.....	137	\$300	14	10.2
Total.....	2,453	.....	134	5.5

¹ Compiled from table 24, opposite page 130.

² One of the 31 pensioners is in receipt of a \$1,000 pension granted by special legislative act.

³ The dependents' pensions in the health department are limited to cases of death in the performance of duty.

The proportion of deaths of employees due to the direct results of the performance of duty in the two most hazardous occupations of the city's service is brought out in tables 20-a and 21-a on pages 126 and 128. The totals for the 15-year period from 1900 to 1914 are summarized as follows:

Department	Total Number of Deaths 1900 to 1914	Deaths Due to Performance of Duty	
		Number	Per Cent. of Total Deaths
Police.....	1,222	51	4.2
Fire.....	419	95	22.7
Total.....	1,641	146	8.9

Doubtful justification of pensions to dependents of those dying from ordinary causes

Under the present plan the bulk, or over 90% of all dependents' pensions, both as to number of beneficiaries and amounts annually paid, has been granted in cases of deaths of employees not caused by the performance of hazardous duty. The assumption by the city in three branches of the service,¹ of a principle of support which has equal application to the city's entire personnel is a precedent which, no doubt, will be used by other groups of employees as an argument for the extension of similar benefits to their dependents.

Pensions to widows, orphans and other members of a deceased employee's family are an unavoidable and costly feature of pension plans where no return of an employee's theoretical equity in his prospective pension is made in case of his separation from service before becoming entitled to retirement. The arguments for the return of an equivalent are strong. Non-contributory plans either at their establishment or after a few years of operation are forced to include widows' pensions and lump sum gratuities as a costly alternative for returning to an employee leaving the service the contributions he has paid into the pension fund.

The propriety of supporting for life this class of dependents at the taxpayers' expense is not quite evident. The following questions are raised:

1. Should an employee be exempt from the plain duty of any citizen to guard his family against the ordinary risk of death not resulting as a direct consequence of his occupation?
2. Is the city justified in distributing money raised by general taxation for the support of dependents of civil employees who by reason of steady employment are in a better position to make provision for their families than the average citizen?

¹ The health department pension fund has as yet no provision for the support of families of employees who die from ordinary causes.

It is difficult to answer these questions in the affirmative and thereby establish a logical foundation for the payment of this class of benefits. It must be kept in mind that they are features of pension plans in operative city departments. The maintenance of a proper standard of efficiency in the public service is the main foundation of such plans,—an object accomplishing a public purpose and therefore justifying the expenditure of the taxpayer's money. The inclusion of benefit provisions for the dependents of those dying from ordinary causes transforms the pension plans into charitable schemes wholly out of place in their exclusive application to employees of city departments.

Inequitable distribution of benefits

The existing provisions, as indicated in the chart opposite page 12, are applicable to the widows and children of policemen and street cleaners who die from ordinary causes, not contingent upon the performance of their duties, after 10 years of active service or after retirement from the service on pension. The maximum amounts allowed under the law are generally granted,—\$300¹ in the police and \$200 in the street cleaning department. The provisions of the Fire department relief fund allow special privileges, by making the benefits which are limited to \$300 per annum available without any restriction regarding the deceased fireman's length of service, and by permitting dependent parents to become beneficiaries. No provision is made in the health department pension fund for the dependents of an employee whose death is not caused in the performance of duty.

The inequitable distribution of benefits is not limited to the privileged treatment in the various groups of employees. Within the same department, pensions of uniform amounts are granted regardless of the value of an employee's services as measured by his salary or length of employment. As a matter of fact, the shorter the period of service the greater the city's expense. The widow of a young employee will receive generally more pension payments than the widow of an older man who has rendered longer service.

Pensions insecure and based on principle of charity

The grant of pensions is discretionary with the heads of the departments, who have also full power of reduction, increase and revocation of the pensions already granted. The "need" of applicants and their moral conduct, which bear no logical relation to the deceased employee's equity in the fund, provide the basis for administrative action. These conditions may properly be used as a guide in the doling out of charity, but are entirely irrelevant in the application of provisions of a departmental pension fund. Even if the principle of charity were considered proper as a basis for the distribution of civil service pensions, the necessary machinery for the determination of facts is lacking.

¹ The provisions of the police pension fund may be interpreted to allow the granting of pensions of \$600 per annum to orphaned children. Such interpretation, however, has not been adopted, and \$300 is the maximum pension granted.

Problem may be solved by separate fund for widows and orphans

Pensions to dependents of employees have been included in various civil service pension plans with praiseworthy benevolence but with complete lack of knowledge of their ultimate cost. If the city's pension system is to be placed on a sound basis, and adequate provision is to be made for meeting the immediate and ultimate obligations assumed, the benefits to employees themselves will probably require as much financial provision on the part of the city and employees as may reasonably be recommended. Additional benefits to dependents would make the cost prohibitive as a compulsory measure.

At the same time, due consideration must be given to the fact that the average employee is frequently debarred from making suitable provision for his family in case of his death, either through savings or adequate insurance. Such provision offered at cost would place within the employee's reach the means of carrying out at his own expense his principal family obligations. A separate fund for pensions to widows and orphans might be established, and the cost met by salary deductions either at the option of each individual employee or upon a majority vote of groups of employees. This suggestion is made very tentatively and merely to indicate an intention to give the important problem very careful consideration.

CHAPTER III

METHODS OF FINANCING AND SOURCES OF INCOME

Inevitable growth of future claims disregarded at establishment

Lack of knowledge of the extent of future obligations and oblique methods of financing fund requirements were the main characteristics in the establishment of the city's pension funds.

A rough guess was first made of the probable amounts required to meet currently maturing pension claims for a few years ahead. The next step was to assume that these demands would remain stationary forever thereafter or, at worse, increase in equal ratio with the annual payroll. The goal of the procedure was to secure an income preferably through the automatic diversion to the fund of more or less obscure miscellaneous city revenues. In the selection of such revenues care was generally taken that the proceeds would net some margin of safety over and above the guessed annual pension demands.

While the whole procedure deserves condemnation, its principal fallacy is the optimistic expectation of a stationary or only slightly increasing future pension charge. The persistence in this misconception, even to the present day, is unfortunate and surprising. It continues to lay the foundation for future disaster of newly established funds and greatly handicaps the introduction of sane methods of financing pension systems. The great number of object lessons furnished by the experience of pension funds abroad, as well as in the United States, has been in the past and is at present ignored. Pension disbursements, according to length of operation and extent of benefits allowed by the various systems, have risen from a fractional part to 30 or more per cent. of the active payroll.¹ The city's own experience gives a foretaste of the future unavoidable growth of pension demands if existing conditions are allowed to continue. The following statement² shows the increasing annual pension demands of the nine pension funds since 1905, expressed as a percentage of the corresponding active payrolls:

¹ London police pensions amounted in 1914, after 70 years of operation, to 30% of the payroll. The present proportion of the active payroll paid in pensions is 17% in the French National Civil Service, 33% in the Austrian Civil Service, 37% in the Municipal Civil Service of Berlin.

² Compiled from Tables 63 to 71, pages 165 to 171.

Pension Fund	Year Fund Estab- lished	Proportion of Pensions to Payroll During the Years Indicated									
		1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
1. Police Pension Fund.....	1857	11.4	11.3	12.1	12.1	12.2	12.4	13.0	14.5	15.7	16.2
2. Fire Department Relief Fund.....	1871	11.8	11.3	11.3	11.3	11.6	12.1	13.1	14.4	13.9	14.1
3. Teachers' Retirement Fund	1894	....	3.7	3.9	3.8	3.9	4.0	4.1	3.8	4.1	4.2
4. Health Department Pen- sion Fund.....	1894	1.6	1.5	2.3	2.3	2.6	2.7	2.8	3.3	3.9	5.9
5. College of the City of N. Y. Retirement Fund.....	1902	6.1	4.5	3.5	3.5	2.4	2.5	1.1	1.3	1.2	0.9
6. City of New York Em- ployees' ("Grady") Re- tirement Fund.....	1906	....	....	....	....	....	....	0.02	0.06	0.07	0.2
7. Department of Street Clean- ing Relief and Pension Fund.....	1911	....	....	....	....	....	....	....	0.4	2.4	3.5
8. Supreme Court, First De- partment, Retirement Fund.....	1911	....	....	....	....	....	....	0.1	0.6	1.4	1.8
9. Supreme Court, Second Department, Retirement Fund.....	1914	....	....	....	....	....	....	....	....	....	0.2
Total, All Funds.....		....	....	....	....	....	....	4.1	4.2	4.6	4.8

The only exception in the above illustrated expansion of pension funds is that of the College of the City of New York, the pensions having decreased during the ten year period from 6.1% to 0.9% of the active payroll. The fund applies, however, to a small service of a little more than 200 members, and is, therefore, open to accidental, irregular fluctuations. Thus, in October, 1915, the pension list was increased and approximately 2.4% of the amount of the active payroll was paid by the fund in pensions.

Fund revenues increased to keep pace with pension demands

The originators of the pension systems were under the impression that they were establishing "self-supporting" funds. This delusion was soon dissipated, however, as the rapidly growing obligations of the funds threatened to wipe out their "reserves" accumulated as a result of the margins of safety allowed in selecting original sources of revenue. The application of new municipal revenues was generally first resorted to. When these became inadequate, the salaries of employees were assessed for the benefit of the funds, and finally, as a last resort to save the older funds from collapsing, legislation was secured to compel the city to provide for annual deficiencies by means of budgetary appropriations and the issue of special revenue bonds.

A general idea of the struggles of the pension funds for increased sources of revenue may be obtained from facts presented in Table 51, opposite page 156. This table shows that the city supported the police and fire pension funds from the date of their establishment in 1857 and 1871, respec-

tively, up to and including the year 1892, out of its miscellaneous revenues. The subsequent inclusion of other forms of revenue and the percentage proportion of total annual receipts of all funds secured from various sources are presented as follows:¹

Year	Total Receipts		Per Cent. of Total Receipts Derived from Sources Indicated				
	Amount	Per Cent.	Em- ployees' Contri- butions	Indirect City Contri- butions	Direct City Contri- butions	Interest	Donations, Bequests, Rewards, etc.
1893	\$756,420.76	100	8.18	87.51	.....	3.96	.35
1894	766,752.17	100	12.27	83.62	.....	3.93	.18
1895	858,871.67	100	11.88	84.11	.....	3.21	.80
1896	1,319,930.22	100	8.24	89.27	.....	2.32	.17
1897	1,431,722.53	100	11.00	85.78	.....	2.93	.29
1898	1,571,414.05	100	13.69	82.62	.....	3.52	.17
1899	1,687,450.89	100	14.88	80.58	.....	3.93	.61
1900	1,757,267.72	100	13.15	82.50	.....	4.12	.23
1901	1,708,094.58	100	13.25	82.21	.....	4.36	.18
1902	1,835,993.34	100	11.48	84.19	.....	4.13	.20
1903	1,658,777.87	100	12.98	80.90	.....	5.91	.21
1904	2,121,721.89	100	10.31	76.01	9.28	4.14	.26
1905	2,347,196.86	100	12.54	75.74	8.26	3.36	.10
1906	2,853,847.80	100	14.72	68.30	14.02	2.80	.16
1907	2,972,642.96	100	14.29	68.52	13.46	2.85	.88
1908	3,152,507.91	100	14.44	69.90	12.69	2.85	.12
1909	3,223,118.93	100	14.14	70.29	12.41	2.90	.26
1910	3,288,920.52	100	15.76	62.03	18.24	2.82	1.15
1911	3,694,600.95	100	14.55	60.02	23.02	2.16	.25
1912	4,381,728.13	100	15.69	53.20	28.85	2.13	.13
1913	4,801,884.06	100	14.75	52.51	30.72	2.00	.02
1914	5,342,507.65	100	14.13	52.47	31.15	2.22	.03

During the 59 years of past pension legislation, hardly a year passed without some new revenue being thought of as a convenient source of income to one or the other of the fast growing pension funds. The multitude of the present sources is shown in the chart opposite page 4. The amounts realized by the combined nine pension funds from each of these sources since their establishment and during the year 1914 are presented in the following tabulation.

¹ Compiled from Table 51, opposite page 156.

RECEIPTS OF CITY'S PENSION FUNDS, BY SOURCES
Summary of Totals for the Years 1857 to 1914 and for the Year 1914

Source of Receipts	1857 to 1914		1914	
	Amount	Per Cent. of Total Receipts	Amount	Per Cent. of Total Receipts
<i>1—Employees' Contributions . . .</i>	<i>\$7,349,058.13</i>	<i>12.24</i>	<i>\$754,724.38</i>	<i>14.13</i>
<i>2—Direct City Contributions . . .</i>	<i>7,845,448.58</i>	<i>13.07</i>	<i>1,664,552.36</i>	<i>31.15</i>
Budgetary Appropriations . . .	6,891,448.84	11.48	1,450,000.00	27.14
Special Revenue Bonds . . .	953,999.74	1.59	214,552.36	4.01
<i>3—Indirect City Contributions . .</i>	<i>42,255,968.12</i>	<i>70.39</i>	<i>2,803,068.60</i>	<i>52.47</i>
Absence Deductions, Fines, etc., from Employees . . .	9,934,385.55	16.55	737,271.65	13.80
Unexpended Balances of Appropriations	3,114,936.85	5.19	122,171.75	2.29
Sales of Condemned Departmental Property, Unclaimed Cash and Sales of Unclaimed Property	491,380.13	.82	32,973.92	.61
Excise Licenses	21,562,264.52	35.92	1,333,247.61	24.96
Boiler Inspection Certificates	616,804.12	1.03	24,768.00	.46
Masked Ball Permits . . .	301,395.00	.50	8,445.00	.16
Pistol Permits	71,236.50	.12	4,349.50	.08
Penalties for Violation of Coal Law	2,445.00	.....	.....	.....
Penalties for Violation of Agricultural Law	28,740.11	.05	.....	.....
Identification Card Fees . .	204.30	.....	14.50	.....
"Fire Prevention" Licenses and Penalties . .	2,746,494.44	4.58	132,289.28	2.48
Sale of Seized Combustibles	551.19	.....	.....	.....
Foreign Fire Insurance Tax	2,096,411.16	3.49	145,361.81	2.72
Redemption and Sale of Incumbrances	17,503.17	.03	4,965.81	.09
Sale of Refuse and Garbage, Scow Trimming and Dumping Privileges	231,641.82	.38	166,250.77	3.11
Penalties for Violation of Sanitary Code	419,675.23	.70	66,599.00	1.25
Searches, Transcripts of Births, Marriages and Deaths	163,649.42	.27	.....	.....
Premium on Bonds Sold and Discount on Bonds Purchased	79,838.05	.13	24,350.00	.46
Balances at Consolidation of Other Funds	376,411.56	.63	.....	.....
<i>4—Donations, Bequests, Rewards, etc.</i>	<i>305,846.40</i>	<i>.51</i>	<i>1,578.01</i>	<i>.03</i>
<i>5—Interest</i>	<i>2,271,951.22</i>	<i>3.79</i>	<i>118,594.30</i>	<i>2.22</i>
<i>Total Receipts</i>	<i>\$60,023,272.45</i>	<i>100.00</i>	<i>\$5,342,507.65</i>	<i>100.00</i>

Indirect city contributions delay reorganization

Of main significance in the data presented in the preceding tabulation is the fact that \$42,000,000, or 70% of the total \$60,000,000 absorbed by the nine funds since their establishment, was diverted from its course to the city treasury without public realization of the full extent of the transaction.

The constant extension and liberalization of the city's pension policy in the past is directly due to the comparative ease with which its pension funds secured cash through indirect methods, apparently imposing no burden either on the taxpayer or on the beneficiary. It is obvious that the city would have revised its pension provisions long ago if the amounts it indirectly contributed had appeared in the annual budgets as direct appropriations clearly labeled "for pensions." In the meantime, the promises of liberal benefits incorporated in the pension laws during the period of earlier pension prosperity have begun to develop into constantly increasing maturing claims. Only since 1904, when the police fund began slowly to emerge from under the cover of indirect support and make demands upon direct budgetary appropriations, has the public had a fair opportunity to acquaint itself with the possibilities for rapid expansion of uncalculated and loosely administered pension systems.

Without decreasing the proportion of its support, the city has gradually changed the sources of revenue. While in the earlier days the city's contributions were made up entirely from indirect sources, in 1914, as shown in the tabulation on page 53, of the total receipts of \$5,342,507, the city contributed indirectly 52.47%, or \$2,803,058, while 31.15%, or \$1,664,552, was made available through direct budgetary appropriations and the issue of special revenue bonds. The city's total support in 1914 amounted, therefore, to \$4,467,610, or 83.62% of the total receipts of the nine pension funds.

The proportion of the income of the nine pension funds in 1914 derived from indirect city contributions is indicated below:¹

Pension Fund	Total Receipts in 1914 from all Sources	Indirect City Contributions	
		Amount	Per Cent. of Total Receipts
1. Police Pension Fund.....	\$2,452,013.53	\$679,616.26	27.72
2. Fire Department Relief Fund.....	1,055,381.64	821,266.93	77.82
3. Teachers' Retirement Fund.....	1,077,142.64	746,003.92	69.26
4. Health Department Pension Fund....	94,085.09	66,599.00	70.79
5. College of the City of New York Retirement Fund.....	127.14	.....	.....
6. City of New York Employees' ("Grady") Retirement Fund.....	96,663.26	96,663.26	100.00
7. Department of Street Cleaning Relief and Pension Fund.....	549,233.63	388,363.85	70.71
8. Supreme Court, First Department, Retirement Fund.....	16,960.72	4,545.38	26.80
9. Supreme Court, Second Department, Retirement Fund.....	900.00	.....	.....
Total, All Funds.....	\$5,342,507.65	\$2,803,058.60	52.47

¹ Compiled from Table 53, opposite page 156.

Excise moneys

The largest single source of the city's indirect support is a proportion of the city's share of excise moneys. As shown in the table on page 53, \$21,562,264 of excise license moneys was paid to the pension funds in the past. In 1914, a total of \$1,333,247, or 24.96% of the total receipts of all nine funds, accrued in this manner.

The proportion of receipts of the five pension funds in 1914, derived from excise moneys under the legal provisions set forth in the chart opposite page 4, was as follows:

Pension Fund	Total Receipts in 1914 from all Sources	Receipts from Excise Licenses	
		Amount	Per Cent. of Total Receipts
Police Pension Fund.....	\$2,452,013.53	\$430,000.00	17.54
Fire Department Relief Fund.....	1,055,381.64	525,000.00	49.75
Teachers' Retirement Fund.....	1,077,142.64	281,584.35	26.14
College of the City of New York Retirement Fund.....	127.14	.....¹	.....
City of New York Employees' ("Grady") Retirement Fund.....	96,663.26	96,663.26	100.00
Total.....	\$4,681,328.21	\$1,333,247.61	28.48

¹ This fund is entitled to 1% of the city's share of excise moneys "as needed," which it receives from time to time. A payment of \$10,000 was made to the fund in 1913. The \$127.14 received in 1914 is interest on bank deposits.

The total receipts of the city from excise licenses have been decreasing since 1910, and in view of recently imposed restrictions are expected to decline still further in the future. The funds of the fire department and the department of education, which are entitled to a fixed percentage of the net excise receipts, therefore derive decreasing amounts from this source. The police fund is unaffected, as its share is limited to a fixed annual amount of \$430,000. The fund of the City College has not developed as yet the need for its maximum share of 1% of the net receipts. The fund operating under the "Grady Law" is not restricted in its demands on the excise moneys either to a definite amount or to a fixed proportion of the total receipts.

To facilitate an understanding of these somewhat complicated conditions, and to afford an idea of the future sufficiency of excise moneys as a source of revenue for the five pension funds, the following statement for the years 1910 to 1914 is presented:

Year	City's Net Receipts from Excise Licenses	Amounts Paid to City's Pension Funds				
		Police Pension Fund	Fire Department Relief Fund	Teachers' Retirement Fund	College of the City of New York Retirement Fund	City of New York Employees' ("Grady") Retirement Fund
1910	\$5,836,063.26	\$430,000.00	\$438,039.40	\$291,803.16	.....	\$3,083.28
1911	5,731,593.57	430,000.00	555,450.35	286,579.67	\$10,000.00	8,253.56
1912	5,683,597.58	430,000.00	546,862.28	284,212.31	.....	25,419.95
1913	5,631,687.16	430,000.00	545,565.46	281,584.35	10,000.00	30,980.05
1914	5,523,381.50	430,000.00	525,000.00	276,169.07 ¹	.....	96,712.32 ¹

¹The amounts credited to the Teachers' and "Grady" funds differ slightly from those shown in the preceding statement. This is due to bookkeeping differences, as the two statements have been compiled from different sources.

Employees' fines and absence deductions

The next largest indirect source of revenue consists of the amounts of disciplinary and absent time deductions from the salaries of employees. The tabulation on page 53 shows that \$9,934,385.55, or 16.55% of the total receipts of all funds since their establishment, were derived from this source. In 1914 the amount was \$737,271.65 and the percentage 13.80%.

Because of the prevailing tendency to regard these deductions from payrolls as contributions of employees, it is pertinent to point out that their principal object is the enforcement of discipline, and they would have been made even were there no pension funds in existence. The amounts deducted would have been utilized in reducing direct taxation, and their present payment into the pension funds is therefore considered as an indirect and therefore highly undesirable city contribution.

Four pension funds derive a part of their income from this source, as shown in the following statement for the year 1914:

Pension Fund	Total Receipts in 1914 from all Sources	Receipts from Disciplinary and Absent Time Deductions from Payrolls	
		Amount	Per Cent. of Total Receipts
Police Pension Fund.....	\$2,452,013.53	\$174,137.56	7.10
Fire Department Relief Fund.....	1,055,381.64	7,883.83	.75
Teachers' Retirement Fund.....	1,077,142.64	464,419.57	43.12
Department of Street Cleaning Relief and Pension Fund.....	549,233.63	90,830.69	16.54
Total.....	\$5,133,771.44	\$737,271.65	14.36

Unexpended balances of appropriations

Particularly vicious in principle are legal provisions authorizing the use of unexpended balances, as they put a premium on "padding" estimates for salary appropriations. In the police department since 1886, in the street cleaning department, and in the Supreme Court, First Department, since 1912, substantial amounts have been transferred to the corresponding pension funds in this manner, as shown in the following statement:

Year	Unexpended Balances of Salary Appropriations Paid into Pension Funds			
	Total	Police Pension Fund	Department of Street Cleaning Relief and Pension Fund	Supreme Court, First Department, Retirement Fund
1886.....	\$114,287.42	\$114,287.42	.....	.....
1887.....	104,442.73	104,442.73	.....	.....
1888.....	45,000.36	45,000.36	.....	.....
1889.....	90,405.59	90,405.59	.....	.....
1890.....	116,356.29	116,356.29	.....	.....
1891.....	34,968.68	34,968.68	.....	.....
1892.....	69,295.39	69,295.39	.....	.....
1893.....	104,022.92	104,022.92	.....	.....
1894.....	88,055.05	88,055.05	.....	.....
1895.....	53,496.33	53,496.33	.....	.....
1896.....	370,295.35	370,295.35	.....	.....
1897.....	103,686.13	103,686.13	.....	.....
1898.....	76,769.71	76,769.71	.....	.....
1899.....	54,846.39	54,846.39	.....	.....
1900.....	219,495.67	219,495.67	.....	.....
1901.....	30,610.56	30,610.56	.....	.....
1902.....	173,410.77	173,410.77	.....	.....
1903.....	99,487.89	99,487.89	.....	.....
1904.....	25,918.81	25,918.81	.....	.....
1905.....	16,531.05	16,531.05	.....	.....
1906.....	99,619.68	99,619.68	.....	.....
1907.....	166,485.11	166,485.11	.....	.....
1908.....	319,538.48	319,538.48	.....	.....
1909.....	250,846.43	250,846.43	.....	.....
1910.....	88,367.99	88,367.99	.....	.....
1911.....	2,955.43	2,955.43	.....	.....
1912.....	37,307.43	.....	\$35,254.40	\$2,053.03
1913.....	36,261.06	3,870.04	30,582.70	1,808.32
1914.....	122,171.75	29,542.62	88,083.75	4,545.38
Total.....	\$3,114,936.85	\$2,952,609.27	\$153,920.85	\$8,406.73

Employees contribute since 1893

The employees contribute a fixed percentage of their salaries to five of the city's pension funds, as follows:

Pension Fund	Per Cent. of Salary	Date When Contributions Began
Police Pension Fund.....	2%	1893
Teachers' Retirement Fund.....	1%	1896 to 1901 from Brooklyn teachers, since 1905 from all teachers
Health Department Pension Fund.....	1%	1907
Department of Street Cleaning Relief and Pension Fund.....	3%	1911
Supreme Court, First Department, Retirement Fund.....	1%	1913

In 1914 the city's pension funds derived the following proportions of their income from contributions of employees:

Pension Fund	Total Receipts in 1914 from All Sources	Employees' Contributions	
		Amount	Per Cent. of Total Receipts
1. Police Pension Fund.....	\$2,452,013.53	\$315,253.05	12.86
2. Fire Department Relief Fund.....	1,055,381.64	.....	.....
3. Teachers' Retirement Fund.....	1,077,142.64	285,257.52	26.48
4. Health Department Pension Fund.....	94,085.09	13,393.19	14.23
5. College of the City of New York Retirement Fund.....	127.14	.....	.....
6. City of New York Employees' ("Grady") Retirement Fund.....	96,663.26	.....	.....
7. Department of Street Cleaning Relief and Pension Fund.....	549,233.63	134,734.06	24.53
8. Supreme Court, First Department, Retirement Fund.....	16,960.72	6,086.56	35.89
9. Supreme Court, Second Department, Retirement Fund.....	900.00	.....	.....
Total.....	\$5,342,507.65	\$754,724.38	14.13

Salary assessments have been imposed upon employees from considerations of expediency rather than in full recognition of the advantages to be gained from the operation of equitable contributory systems. The return of contributions in case of an employee's dismissal, resignation or death is one of the most advantageous features of a contributory plan. Besides giving the contributors a sense of security, it facilitates the discharge of inefficient employees before they become eligible to retirement, and reduces the necessity for pensions to the dependents of deceased employees whose death is not caused in the performance of duty. These advantages are not realized, as none of the city's pension funds makes provision for refunds. The only exception is the teachers' retirement fund, where contributions without

interest are returned to discharged teachers. Since teachers, however, are rarely discharged, this exception has no practical application.

The assessment of a flat percentage of salary, on all employees irrespective of sex, age at entrance into the service, and the fact that some become eligible to benefits after having contributed little or nothing to a newly established fund, is an obviously crude arrangement, lacking all elements of equity.

The employees' contributions, fixed as they are at a uniform percentage of salary, provide a constantly decreasing proportion of the annually maturing pension claims which rise each year to a larger percentage of the active payroll, as shown in the statement on page 51.

In 1914 the employees' contributions were sufficient to pay the following proportions of pension demands upon the various funds:

Pension Fund	Pensions Paid in 1914		Percentage of Active Payroll	
	Amount	Per Cent. of Active Payroll	Contributed by Employees	Paid from Other Fund Revenues
Police Pension Fund.....	\$2,456,805.13	16.16	2	14.16
Teachers' Retirement Fund.....	1,183,397.08	4.15	1	3.15
Health Department Pension Fund	78,776.65	5.92	1	4.92
Department of Street Cleaning				
Relief and Pension Fund.....	163,053.71	3.49	3	0.49
Supreme Court, First Department, Retirement Fund.....	10,822.80	1.78	1	0.78

Direct taxation resorted to since 1904

In the police pension fund since 1904¹ and the fire department relief fund since 1912, annual deficiencies have been covered by means of direct budgetary appropriations and the issue of special revenue bonds. The fund of the Supreme Court, First Department, has derived, since its establishment in 1911, a part of its income from direct taxation. The pension granted from the Supreme Court, Second Department, retirement fund has been paid entirely by means of special revenue bonds.

These direct city contributions to the four funds were as follows:²

¹ Mandatory provision requiring the city to cover deficiencies in the police pension fund was passed in 1892 (chapter 539). The then exhausted condition of the fund was subsequently relieved, however, by a 2% assessment on salaries of policemen since 1893, and the reversion to the fund of an unexpended balance of appropriation in 1896 amounting to \$370,295.33. The increased revenues provided only temporary relief, as they became entirely inadequate to pay the constantly increasing pension roll, and in 1904 the first direct budgetary appropriation was made to enable the fund to meet its current obligations.

² Compiled from Tables 54 and 55, opposite page 156; and Tables 61 and 62 on pages 162 and 163.

Year	Amounts Paid to Funds Through Budgetary Appropriations and Special Revenue Bonds			
	Police Pension Fund	Fire Department Relief Fund	Supreme Court, First Dept. Retirement Fund	Supreme Court, Second Dept., Retirement Fund
1904.....	\$197,000.00	.....	.....	.....
1905.....	193,946.26	.....	.....	.....
1906.....	400,000.00	.....	.....	.....
1907.....	400,000.00	.....	.....	.....
1908.....	400,000.00	.....	.....	.....
1909.....	400,000.00	.....	.....	.....
1910.....	600,000.00	.....	.....	.....
1911.....	850,000.00	.....	\$499.98	.....
1912.....	1,135,188.22	\$127,097.60	2,000.00	.....
1913.....	1,320,538.34	149,741.70	4,884.12	.....
1914.....	1,450,000.00	207,374.94	6,277.42	\$900.00
Total.....	\$7,346,672.82	\$484,214.24	\$13,661.52	\$900.00

The proportion of the income of the four pension funds in 1914 derived from direct city contributions was as follows:¹

Pension Fund	Total Receipts in 1914 from All Sources	Direct City Contributions	
		Amount	Per Cent. of Total Receipts
Police Pension Fund.....	\$2,452,013.53	\$1,450,000.00	59.13
Fire Department Relief Fund.....	1,055,381.64	207,374.94	19.65
Supreme Court, First Department, Retirement Fund.....	16,960.72	6,277.42	37.01
Supreme Court, Second Department, Retirement Fund.....	900.00	900.00	100.00

Donations and interest provide insignificant part of income

The receipt of donations, gifts and bequests by the pension funds of the departments of police, fire, education and street cleaning is specifically sanctioned by law (see statement opposite page 4). The entire income from this source in the past amounted to \$305,846.40. In 1914 it was \$1,578.01.

Interest on investments and bank deposits was an important part of the income in the earlier days, when the older funds were in the accumulative stage of development, as may be seen from the data presented in Table 51, opposite page 156. With the gradual exhaustion of the funds, however, this source of revenue decreased, and since 1906 netted less than 3% of the total annual income. In the pension funds of the departments of fire and education, interest is derived from permanent funds of about \$800,000 each, set aside

¹ Compiled from Table 53, opposite page 156.

in 1904 and 1905, respectively, the law stipulating that they shall not be encroached upon for the payment of annual deficiencies.

The small proportion of the income of the nine pension funds in 1914 derived from the above mentioned sources is indicated in the following statement:¹

Pension Fund	Total Receipts in 1914 from All Sources	Donations, Bequests, etc.		Interest	
		Amount	Per Cent. of Total Receipts	Amount	Per Cent. of Total Receipts
1. Police Pension Fund.....	\$2,452,013.53	\$869.11	.03	\$6,275.11	.26
2. Fire Department Relief Fund	1,055,381.64	704.90	.07	26,034.87	2.46
3. Teachers' Retirement Fund.	1,077,142.64	.....	....	45,881.20	4.26
4. Health Department Pension Fund.....	94,085.09	.....	....	14,092.90	14.98
5. College of the City of N. Y. Retirement Fund.....	127.14	.....	....	127.14 ²	100.00 ²
6. City of New York Employees' ("Grady") Retirement Fund.....	96,663.26	.....	....	.....	....
7. Department of Street Cleaning Relief and Pension Fund.....	549,233.63	4.00	....	26,131.72	4.76
8. Supreme Court, First Department, Retirement Fund	16,960.72	.....	....	51.36	.30
9. Supreme Court, Second Department, Retirement Fund	900.00	.....	....	.....	....
Total.....	\$5,342,507.65	\$1,578.01	.03	\$118,594.30	2.22

Receipts and disbursements of individual funds

Detailed statements of receipts and disbursements for each of the city's nine pension funds are presented in Tables 54 to 62, opposite pages 156 to 163. Summaries of totals by sources of receipts and objects of expenditures since establishment, and during the year 1914, are set forth in Tables 52 and 53 opposite page 156. The following statements show the total transactions of the funds in the past and during the year 1914:

¹ Compiled from Table 53, opposite page 156.

² The fund of the City College draws on the city's share of excise moneys as needed up to a maximum of 1% during any one year. In 1914 no excise moneys were drawn upon and the total increment to the fund consisted of interest on its balance from the preceding year.

RECEIPTS, DISBURSEMENTS AND BALANCES OF PENSION FUNDS SINCE ESTABLISHMENT

Pension Fund	Year Established	Total Receipts	Total Disbursements	Balances Dec. 31, 1914
1. Police Pension Fund.....	1857	\$32,193,598.26	\$32,192,866.16	\$732.10
2. Fire Department Relief Fund.....	1871	14,080,249.19	13,228,628.01	851,621.18
3. Teachers' Retirement Fund.....	1894	11,308,146.65	10,401,541.08	906,605.57
4. Health Department Pension Fund.....	1894	806,855.50	472,543.88	334,311.62
5. College of the City of N. Y. Retirement Fund.....	1902	128,843.76	125,896.15	2,947.61
6. City of New York Employees' ("Grady") Retirement Fund.....	1906	171,302.78	171,302.78	.....¹
7. Department of Street Cleaning Relief and Pension Fund.....	1911	1,306,930.75	300,630.58	1,006,300.17
8. Supreme Court, First Department, Retirement Fund.....	1911	31,445.56	22,068.25	9,377.31
9. Supreme Court, Second Department, Retirement Fund.....	1914	900.00	900.00	.....¹
Total.....	....	\$60,028,272.45	\$56,916,376.89	\$3,111,895.56

RECEIPTS AND DISBURSEMENTS OF PENSION FUNDS IN 1914

Pension Fund	Receipts	Disbursements	Surplus (+) or Deficit (-)
1. Police Pension Fund.....	\$2,452,013.53	\$2,458,289.13	- 6,275.60
2. Fire Department Relief Fund.....	1,055,381.64	1,058,561.96	- 3,180.32
3. Teachers' Retirement Fund.....	1,077,142.64	1,184,208.12	- 107,065.48
4. Health Department Pension Fund....	94,085.09	79,487.90	+ 14,597.19
5. College of the City of N. Y. Retirement Fund.....	127.14	4,325.00	- 4,197.86
6. City of New York Employees' ("Grady") Retirement Fund....	96,663.26	96,663.26	.....¹
7. Department of Street Cleaning Relief and Pension Fund.....	549,233.63	166,373.44	+ 382,860.19
8. Supreme Court, First Department, Retirement Fund.....	16,960.72	10,822.80	+ 6,137.92
9. Supreme Court, Second Department, Retirement Fund.....	900.00	900.00	.....¹
Total.....	\$5,342,507.65	\$5,059,631.61	+\$282,876.04

¹The retirement funds for the City of New York ("Grady") employees' and the Supreme Court, Second Department, are not funds within the strict meaning of this term. The Pension demands are met currently by the city from excise moneys and by direct city appropriation, respectively, no balances remaining in the funds for accumulation at interest.

"Unlimited" funds draw increasing part of income from direct taxation

The present nine pension funds of the city may be divided into two groups, according to the extent of their resources. Four of the funds, applicable to the uniformed forces of the departments of police and fire and the employees of the Supreme Courts, First and Second Departments, are practically unlimited in their incomes. According to present laws, the city is obligated to supply the necessary amounts through direct taxation when other fund revenues prove insufficient to meet current obligations. The remaining five funds are limited to incomes from definite sources.

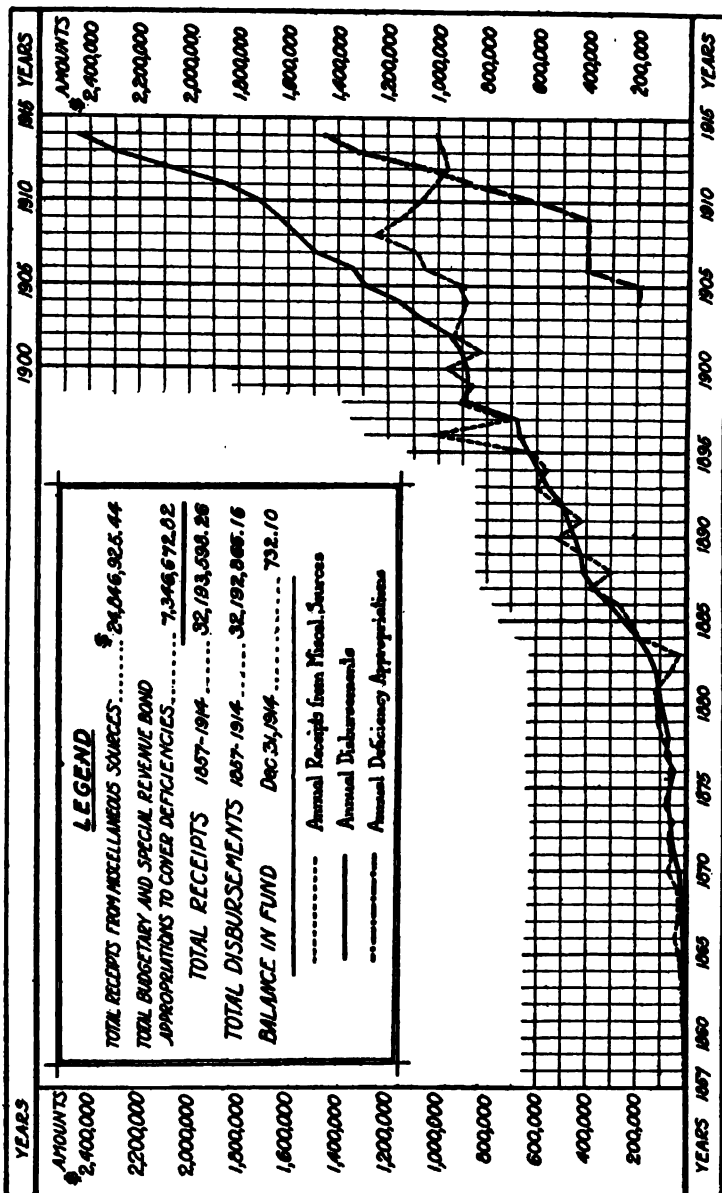
The gradually increasing claims on the city's direct support made by "unlimited" funds in the past is presented separately for each fund in the following statements.

Police pension fund

The transactions of the police pension fund are shown in detail in Table 54, opposite page 156. A graphic illustration of the relation of annual revenues to expenditures is presented in the chart on page 64.

The solid or "pension" line in this chart indicates the annual amounts expended for pensions which increased from \$30 in 1858 to \$2,458,298.13 in 1914. The dotted or "revenue" line shows the annual revenues of the fund received from all sources except direct taxation. The amounts made available by multiplying these sources became more and more inadequate to keep pace with the unrelenting growth of maturing pension demands. In 1904 the fund got permanently under the load. Its accumulations of prior years exhausted, the fund was enabled to keep its obligations to pensioners only by having its annually growing deficits covered out of the general tax levy. The additional or "deficit" line on the chart, drawn by means of dashes and circles, shows the rapid rise of these annual deficits from \$197,000 in 1904 to \$1,450,000 in 1914. A summary of the annual financial transactions of the fund since 1857 is presented on page 65.

CITY OF NEW YORK
COMMISSION ON PENSIONS
POLICE PENSION FUND
ANNUAL RECEIPTS AND DISBURSEMENTS ~ 1857 to 1914

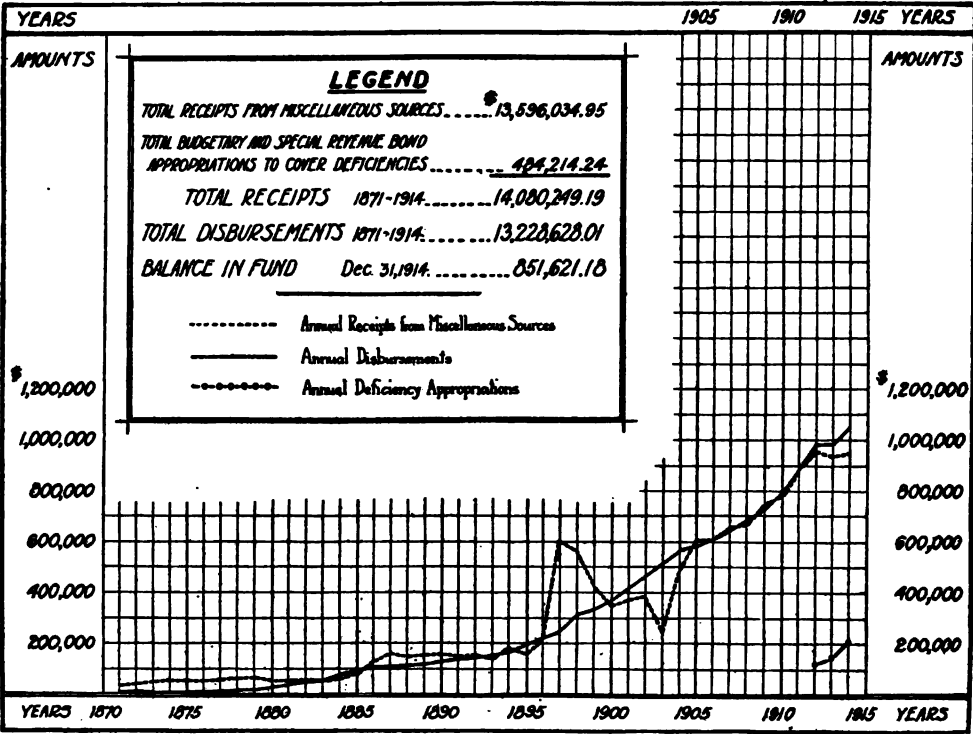


Year	Receipts from		Disbursements	Surplus (+) or Deficit (-)	Balance December 31
	All Sources Except Direct Taxation	Direct Taxation			
1857.....	\$423.10	.....	.....	+\$423.10	\$423.10
1858.....	2,200.00	.....	\$30.00	+2,170.00	2,593.10
1859.....	3,646.37	.....	240.00	+3,406.37	5,999.47
1860.....	5,021.08	.....	809.31	+4,211.77	10,211.24
1861.....	10,050.15	.....	1,475.03	+8,575.12	18,786.36
1862.....	10,065.59	.....	2,133.32	+7,932.27	26,718.63
1863.....	9,203.05	.....	2,398.58	+6,804.47	33,523.10
1864.....	19,801.62	.....	3,906.59	+15,895.03	49,418.13
1865.....	26,479.19	.....	6,680.72	+19,798.47	69,216.60
1866.....	44,465.30	.....	7,257.50	+37,207.80	106,424.40
1867.....	31,456.63	.....	7,965.04	+23,491.59	129,915.99
1868.....	32,100.11	.....	13,676.13	+18,423.98	148,339.97
1869.....	36,124.78	.....	19,483.64	+16,641.14	164,981.11
1870.....	73,523.22	.....	26,452.95	+47,070.27	212,051.38
1871.....	58,473.56	.....	45,675.21	+12,798.35	224,849.73
1872.....	68,630.64	.....	56,954.03	+11,676.61	236,526.34
1873.....	56,113.80	.....	61,434.38	-5,320.58	231,205.76
1874.....	80,776.92	.....	72,941.30	+7,835.62	239,041.38
1875.....	65,376.00	.....	62,214.08	+3,161.92	242,203.30
1876.....	60,909.16	.....	44,596.73	+16,312.43	258,515.73
1877.....	64,939.55	.....	77,259.90	-12,320.35	246,195.38
1878.....	91,715.29	.....	67,574.54	-24,140.75	270,336.13
1879.....	114,293.55	.....	80,270.28	+34,023.27	304,359.40
1880.....	113,869.56	.....	97,916.13	+15,953.43	320,312.83
1881.....	117,696.90	.....	105,308.15	+12,388.75	332,701.58
1882.....	64,312.35	.....	115,928.23	-51,615.88	281,085.70
1883.....	26,410.60	.....	143,120.49	-116,709.89	164,375.81
1884.....	183,545.49	.....	186,981.42	-3,435.93	160,939.88
1885.....	229,366.42	.....	248,114.83	-18,748.41	142,191.47
1886.....	269,783.60	.....	304,418.09	-34,634.49	107,556.98
1887.....	385,071.23	.....	368,367.95	+16,703.28	124,260.26
1888.....	294,829.54	.....	413,976.65	-119,147.11	5,113.15
1889.....	417,152.41	.....	424,630.84	-7,478.43	-2,365.28
1890.....	516,236.79	.....	451,349.36	+64,887.43	62,522.15
1891.....	416,810.88	.....	480,550.34	-63,739.46	-1,217.31
1892.....	522,742.82	.....	509,393.15	+13,349.67	12,132.36
1893.....	608,008.67	.....	563,469.92	+44,538.75	56,671.11
1894.....	562,112.70	.....	594,884.08	-32,771.38	23,899.73
1895.....	618,661.14	.....	636,499.68	-17,838.54	6,061.19
1896.....	1,034,058.78	.....	671,404.03	+362,654.75	368,715.94
1897.....	709,752.60	.....	684,320.90	+25,431.70	394,147.64
1898.....	908,491.13	.....	892,789.08	+15,702.05	409,849.69
1899.....	867,996.56	.....	879,833.38	-11,836.82	398,012.87
1900.....	967,473.41	.....	886,947.87	+80,525.54	478,538.41
1901.....	826,678.23	.....	906,035.20	-79,356.97	399,181.44
1902.....	940,205.57	.....	951,111.31	-10,905.74	388,275.70
1903.....	910,552.33	.....	1,073,150.79	-162,598.46	225,677.24
1904.....	884,696.11	\$197,000.00	1,158,219.93	-76,523.82	149,153.42
1905.....	904,861.46	193,946.26	1,299,275.97	-200,468.25	-51,314.83
1906.....	1,057,556.86	400,000.00	1,342,522.05	+115,034.81	63,719.98
1907.....	1,085,118.19	400,000.00	1,498,311.37	-13,193.18	50,526.80
1908.....	1,255,873.63	400,000.00	1,568,894.26	+86,979.37	137,506.17
1909.....	1,148,498.28	400,000.00	1,634,587.53	-86,089.25	51,416.92
1910.....	1,068,953.57	600,000.00	1,723,614.61	-64,661.04	-3,244.12
1911.....	1,023,878.34	850,000.00	1,852,647.27	+21,231.07	17,986.95
1912.....	962,164.57	1,135,188.22	2,089,614.03	+7,738.76	25,725.71
1913.....	975,702.53	1,320,538.34	2,314,958.88	-18,718.01	7,007.70
1914.....	1,002,013.53	1,450,000.00	2,458,289.13	-6,275.60	732.10
Total.....	\$24,846,925.44	\$7,346,672.82	\$32,192,866.16	+\$732.10	.....

Fire Department Relief Fund

The financial transactions of the fire department relief fund, presented in detail in Table 55, opposite page 156, resemble those of the police pension fund. The accumulation of surpluses in the earlier years of operation was followed by a period of annual deficiencies which would have completely exhausted the fund had the legislature not sequestered the balance of the fund on May 3, 1904, as a permanent "reserve" fund. The insufficiency of the regular statutory income led, as in the case of the police pension fund, to unlimited support of the fund by the city. The city's direct contributions, in the form of special revenue bonds, began in 1912 and have increased annually. The expansion of the fund is presented in the chart below. It is interesting to compare this chart with a similar chart for the police pension fund on page 64.

CITY OF NEW YORK
COMMISSION ON PENSIONS
FIRE DEPARTMENT RELIEF FUND
ANNUAL RECEIPTS AND DISBURSEMENTS ~ 1871 to 1914



The following is a summary of the annual financial transactions of the fund since 1871, the year of its establishment:

Year	Receipts from		Disbursements	Surplus (+) or Deficit (-)	Balance December 31
	All Sources Except Direct Taxation	Direct Taxation			
1871.....	\$35,257.76	.....	\$6,856.42	+\$28,401.34	\$28,401.34
1872.....	42,525.14	.....	13,737.40	+28,787.74	57,189.08
1873.....	49,641.01	.....	3,042.59	+46,598.42	103,787.50
1874.....	60,242.07	.....	4,194.70	+56,047.37	159,834.87
1875.....	59,689.07	.....	4,029.64	+55,659.43	215,494.30
1876.....	55,502.85	.....	5,089.76	+50,413.09	265,907.39
1877.....	62,998.97	.....	6,426.63	+56,572.34	322,479.73
1878.....	64,910.65	.....	16,083.56	+48,827.09	371,306.82
1879.....	68,540.62	.....	17,278.37	+51,262.25	422,569.07
1880.....	54,696.44	.....	27,192.63	+27,503.81	450,072.88
1881.....	56,907.88	.....	37,478.23	+19,429.65	469,502.53
1882.....	57,880.77	.....	48,222.32	+9,658.45	479,160.98
1883.....	57,295.93	.....	55,195.86	+2,100.07	481,261.05
1884.....	64,205.41	.....	77,862.55	-13,657.14	467,603.91
1885.....	83,168.75	.....	90,505.00	-7,336.25	460,267.66
1886.....	132,612.64	.....	103,302.46	+29,310.18	489,577.84
1887.....	169,762.79	.....	111,925.02	+57,837.77	547,415.61
1888.....	155,891.28	.....	114,939.29	+40,951.99	588,367.60
1889.....	159,070.06	.....	121,091.21	+37,978.85	626,346.45
1890.....	162,763.76	.....	131,042.65	+31,721.11	658,067.56
1891.....	156,953.65	.....	138,715.76	+18,237.89	676,305.45
1892.....	160,764.24	.....	146,226.67	+14,537.57	690,843.02
1893.....	148,412.09	.....	157,793.59	-9,381.50	681,461.52
1894.....	175,662.53	.....	170,686.27	+4,976.26	686,437.78
1895.....	161,241.27	.....	197,194.08	-35,952.81	650,484.97
1896.....	212,091.10	.....	223,838.04	-11,746.94	638,738.03
1897.....	601,145.36	.....	250,803.91	+350,341.45	989,079.48
1898.....	564,728.17	.....	317,554.18	+247,173.99	1,236,253.47
1899.....	424,560.90	.....	338,414.99	+86,145.91	1,322,399.38
1900.....	358,987.56	.....	372,649.90	-13,662.34	1,308,737.04
1901.....	373,113.11	.....	421,177.15	-48,064.04	1,260,673.00
1902.....	387,512.77	.....	470,133.31	-82,620.54	1,178,052.46
1903.....	244,957.17	.....	516,402.90	-271,445.73	906,606.73
1904.....	485,578.84	.....	558,074.14	-72,495.30	834,111.43
1905.....	600,813.29	.....	581,757.47	+19,055.82	853,167.25
1906.....	606,053.69	.....	606,108.31	-54.62	853,112.63
1907.....	659,170.84	.....	649,248.59	+9,922.25	863,034.88
1908.....	672,151.67	.....	684,062.43	-11,910.76	851,124.12
1909.....	729,379.24	.....	729,159.76	+219.48	851,343.60
1910.....	790,843.86	.....	792,218.08	-1,374.22	849,969.38
1911.....	881,789.52	.....	880,475.28	+1,314.24	851,283.62
1912.....	859,817.82	\$127,097.60	986,044.78	+870.64	852,154.26
1913.....	838,735.71	149,741.70	985,830.17	+2,647.24	854,801.50
1914.....	848,006.70	207,374.94	1,058,561.96	-3,180.32	851,621.18
Total.....	\$13,596,034.95	\$484,214.24	\$13,228,628.01	+\$851,621.18	.....

Supreme Court, First Department, retirement fund

This fund operates on a somewhat different basis than the funds of the police and fire departments. The law regulating the income of the fund is vague and allows varied interpretation. The pension payments were made in 1911 from a special revenue bond appropriation. In 1912 only part of the obligations was paid from a direct appropriation, the balance being provided for from the Supreme Court's salary accounts. In 1913 a fund was established and a 1% assessment on salaries of employees added as a new source of revenue. At present the employees' contributions are accumulated at interest, and pensions are paid partly from salary appropriations and partly from budgetary pension appropriations. The details of this fund's growth are presented in Table 61, page 162. A summary of the transactions follows:

Year	Receipts from		Disbursements	Surplus	Balance December 31
	All Sources Except Direct Taxation	Direct Taxation			
1911.....	.....	\$499.98	\$499.98	.....	.....
1912.....	\$2,053.03	2,000.00	4,053.03	.....	.....
1913.....	5,047.71	4,884.12	6,692.44	\$3,239.39	\$3,239.39
1914.....	10,683.30	6,277.42	10,822.80	6,137.92	9,377.31
Total.....	\$17,784.04	\$13,661.52	\$22,068.25	\$9,377.31	.....

Supreme Court, Second Department, retirement fund

No fund in the ordinary sense of the word is maintained for this branch of the service. The pensions are paid by the issue of special revenue bonds, and amounted in 1914 to \$900.00.

"Limited" funds in varying degrees of expansion

Five of the city's pension funds are restricted in their income to definite sources, as set forth in detail opposite page 4. The inadequacy of these sources has produced the present difficult situation in the teachers' fund. In other funds different degrees of expansion have been reached, but no immediate critical condition has yet developed.

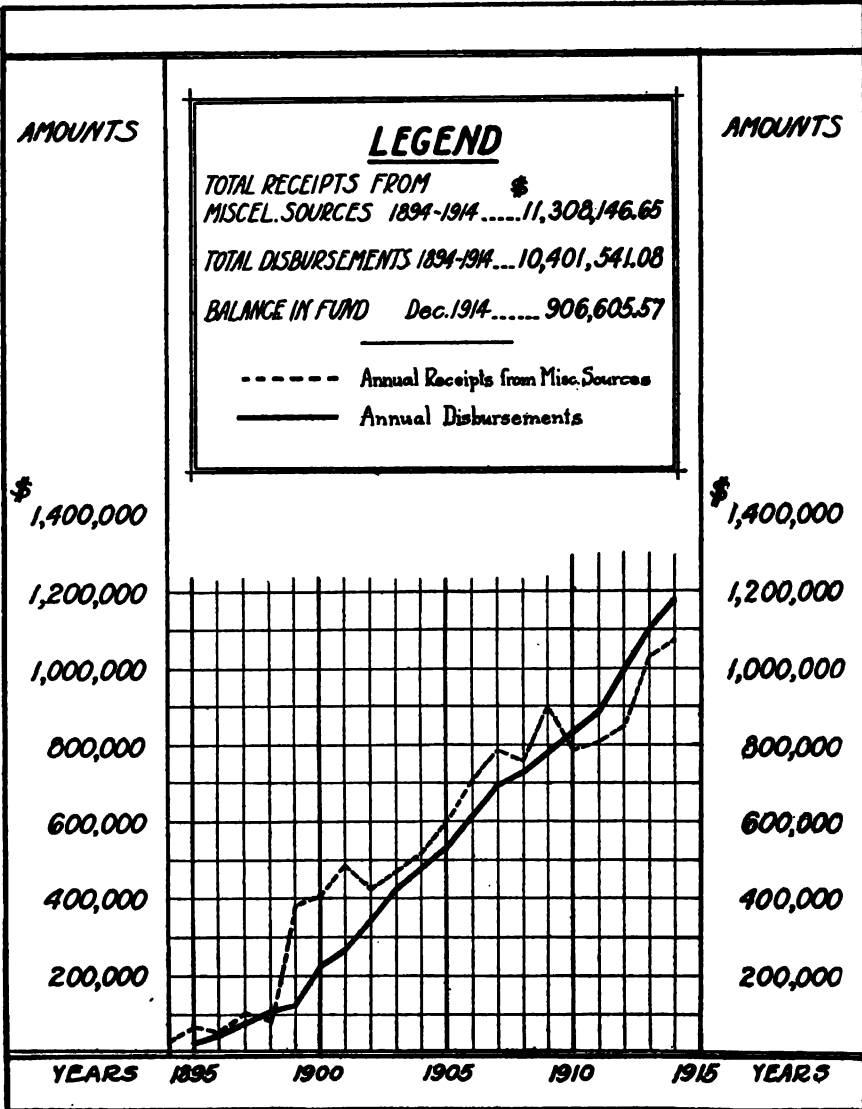
Teachers' retirement fund

The details of the financial transactions of this fund in the past are shown in Table 56, page 157. The chart on page 69 graphically illustrates the long period of accumulation of funds and the subsequent short period of their

CITY OF NEW YORK
COMMISSION ON PENSIONS

TEACHERS' RETIREMENT FUND

ANNUAL RECEIPTS AND DISBURSEMENTS~ 1894 to 1914



dissipation for annual deficiencies. The following summary presents the gradual development of the fund. It must be noted that according to a law passed in 1905, a reserve capital of \$800,000, which is included in the balances shown below, has been established and may not be drawn upon to satisfy current pension obligations.

Year	Receipts	Disbursements	Surplus (+) or Deficit (-)	Balance December 31
1894.....	\$25,060.33	.....	+\$25,060.33	\$25,060.33
1895.....	62,897.08	\$12,633.34	+50,263.74	75,324.07
1896.....	50,504.04	42,595.07	+7,908.97	83,233.04
1897.....	107,628.38	71,539.49	+36,088.89	119,321.93
1898.....	83,800.37	102,157.04	-18,356.67	100,965.26
1899.....	381,579.11	124,296.18	+257,282.93	358,248.19
1900.....	408,038.59	214,563.57	+193,475.02	551,723.21
1901.....	485,108.49	263,805.28	+221,303.21	773,026.42
1902.....	425,767.18	343,017.13	+82,750.05	855,776.47
1903.....	468,060.22	420,026.99	+48,033.23	903,809.70
1904.....	516,003.28	477,418.74	+38,584.54	942,394.24
1905.....	597,048.00	526,502.36	+70,545.64	1,012,939.88
1906.....	706,072.85	616,984.54	+89,088.31	1,102,028.19
1907.....	784,354.89	689,390.64	+94,964.25	1,196,992.44
1908.....	760,176.05	724,129.78	+36,046.27	1,233,038.71
1909.....	898,208.84	777,941.85	+120,266.99	1,353,305.70
1910.....	786,340.54	834,483.49	-48,142.95	1,305,162.75
1911.....	803,734.45	881,071.98	-77,337.53	1,227,825.22
1912.....	849,198.48	983,972.19	-134,773.71	1,093,051.51
1913.....	1,031,422.84 ¹	1,110,803.30	-79,380.46	1,013,671.05
1914.....	1,077,142.64 ²	1,184,208.12	-107,065.48	906,605.57 ³
Total.....	\$11,308,146.65	\$10,401,541.08	+\$906,605.57	.....

Health department pension fund

This fund has been in the accumulative stage during the 21 years of its existence. Its current obligations have in 1915, however, caught up with the current income. The sources of the fund are largely of a stationary nature and the future income will fall below the annual demands. The consequent deficiencies will soon exhaust the present accumulations and a crisis is imminent unless the fund is promptly reorganized.

¹ Includes a \$200,000 advance of excise taxes in this year.

² Includes gross absence deductions. The payment of refunds was delayed due to the critical condition of the fund.

³ This balance contains only \$106,605.57 in excess of the \$800,000 permanent capital. It proved insufficient to cover the fund's shortage in 1915 and resulted in delayed pension payments during the latter part of the year to already retired teachers.

The details of the transactions of this fund are shown in Table 57, page 158. A summary of its development is presented below.

Year	Receipts	Disbursements	Surplus	Balance December 31
1894.....	\$3,916.61	.....	\$3,916.61	\$3,916.61
1895.....	16,072.18	\$218.85	15,853.33	19,769.94
1896.....	23,276.30	1,095.00	22,181.30	41,951.24
1897.....	13,196.19	2,460.00	10,736.19	52,687.43
1898.....	14,394.38	4,629.90	9,764.48	62,451.91
1899.....	13,314.32	7,115.81	6,198.51	68,650.42
1900.....	22,768.16	7,701.29	15,066.87	83,717.29
1901.....	23,194.75	10,575.88	12,618.87	96,336.16
1902.....	29,261.99	12,138.34	17,123.65	113,459.81
1903.....	33,962.26	13,173.29	20,788.97	134,248.78
1904.....	37,290.09	16,590.00	20,700.09	154,948.87
1905.....	49,972.76	18,115.06	31,857.70	186,806.57
1906.....	57,222.40	21,205.24	36,017.16	222,823.73
1907.....	42,018.67	25,271.78	16,746.89	239,570.62
1908.....	37,387.33	29,698.14	7,689.19	247,259.81
1909.....	44,240.32	35,804.76	8,435.56	255,695.37
1910.....	39,293.40	38,870.61	422.79	256,118.16
1911.....	53,447.16	47,965.81	5,481.35	261,599.51
1912.....	65,536.39	45,976.73	19,559.66	281,159.17
1913.....	93,004.75	54,449.49	38,555.26	319,714.43
1914.....	94,085.09	79,487.90	14,597.19	334,311.62
Total.....	\$806,855.50	\$472,543.88	\$334,311.62	.....

College of the City of New York retirement fund

This fund, applying as it does to a membership of a little over 200 professors and instructors, presents a typical illustration of the accidental fluctuations which are apt to occur when the law of probabilities has insufficient scope of operation. The pension demands, after a few years of gradual annual increases, have subsequently declined, and in 1914 only \$4,325 was paid out—the smallest annual charge since 1903. In 1915, however, new additions were made to the pension list, substantially increasing the fund's current obligations.

The income of the fund is derived from excise moneys, as needed, not to exceed, however, 1% of the city's share of such moneys in any one year. The needs of the fund in the past have not approximated this maximum limitation, which in 1914 would have amounted to about \$55,000 (see page 56). The inevitable growth of the fund's future obligations will result in increasing drafts on this source of income and at some future period probably exceed the 1% limitation.

The financial statement for this fund appears in Table 58, page 159. Its transactions are summarized as follows:

Year	Receipts	Disbursements	Surplus (+) or Deficit (-)	Balance December 31
1902.....	\$53,245.83	\$718.74	+\$52,727.09	\$52,527.09
1903.....	1,245.89	13,166.52	-11,920.63	40,606.46
1904.....	1,153.57	17,249.80	-16,096.23	24,510.23
1905.....	555.09	16,330.45	-15,775.36	8,734.87
1906.....	25,442.00	13,540.18	+11,901.82	20,636.69
1907.....	480.37	11,687.39	-11,207.02	9,429.67
1908.....	25,344.23	12,812.37	+12,531.86	21,961.53
1909.....	566.81	9,466.54	-8,899.73	13,061.80
1910.....	280.79	10,449.84	-10,169.05	2,892.75
1911.....	10,178.46	4,741.25	+5,437.21	8,329.96
1912.....	123.13	5,736.36	-5,613.23	2,716.73
1913.....	10,100.45	5,671.71	+4,428.74	7,145.47
1914.....	127.14	4,325.00	-4,197.86	2,947.61
Total.....	\$128,843.76	\$125,896.15	+\$2,947.61	.....

City of New York employees' ("Grady") retirement fund

The pensions under this plan are paid directly from excise taxes. No special fund for the accumulation of a reserve capital at interest is maintained. The annual payments have increased from \$1,500 in 1906 to \$96,663.26 in 1914, as shown below:

1906.....	\$1,500.00	1911.....	\$8,253.64
1907.....	1,500.00	1912.....	25,419.95
1908.....	1,575.00	1913.....	30,957.13
1909.....	2,225.44	1914.....	96,663.26
1910.....	3,208.36		

No limitation is set on the amount which may be drawn from excise moneys. The city's receipts from this source amounted in 1914 to \$5,523,381.50, as shown on page 56. After satisfying the claims of city pension funds, there still remained more than \$4,000,000 to be transferred to the general fund for the reduction of direct taxation. Unless, therefore, additional uses are found for this city revenue, the City of New York employees' retirement fund may expand under present restricted benefit provisions for a great number of years before its annual charge will equal the total of available excise moneys.

Department of street cleaning relief and pension fund

A detailed statement of receipts and disbursements of this fund is presented in Table 60, page 161. The fund is in the early stage of accumulation, its balance amounting to \$1,006,300.17 on December 31, 1914. Its income from all sources during that year constituted almost 12% of the payroll.

Although the income will inevitably decline to a lower percentage in the future, it will still exceed for a number of years the annual pension demands, which were about 3½% of the payroll in 1914 and will gradually rise to a higher proportion.

A summary of the fund's expansion during the four years ending December 31, 1914, is presented as follows:

Year	Receipts	Disbursements	Surplus	Balance December 31
1911.....	\$62,819.40	\$487.27	\$62,332.13	\$62,332.13
1912.....	353,128.94	17,861.62	335,267.32	397,599.45
1913.....	341,748.78	115,908.25	225,840.53	623,439.98
1914.....	549,233.63	166,373.44	382,860.19	1,006,300.17 ¹
Total.....	\$1,306,930.75	\$300,630.58	\$1,006,300.17	.....

¹ This balance does not include the following:

- (1) Unexpended balances—salaries and wages, 1914, not received until April, 1915..... \$90,606.15
- (2) Claim against contractor for scow trimming, now in litigation..... 53,311.20
- (3) Accrued interest on securities, December 31, 1914.

CHAPTER IV

SUMMARY OF CONCLUSIONS

Present System Expensive and Ineffective

The principal defects in the operation of the present mass of contradicting provisions of the city's nine pension funds may be summarized as follows:

From viewpoint of equity to employees and efficiency of service

1. *System discriminates between employees in different branches of the service:* Employees in different branches of the service are covered by provisions of varying degrees of liberality, generally not justified by differences in the nature of the work performed, but dependent only on participation in a particular fund.

2. *System discriminates between individual members of each fund:* The provisions of each fund give unequal advantages to its members through the operation of crude flat rate pension scales and contributions. The amount of pension does not vary with the length of service. The contributions have no logical relation to benefits receivable.

3. *Thirty-seven per cent. of city's employees offered inducement to retire in prime of life:* Five of the nine pension plans, covering about 37% of the municipal service, permit retirement on demand after short periods of service of from 20 to 30 years, irrespective of the applicant's physical condition and ability to perform his duties efficiently.

4. *Forty-three per cent. of the service burdened with superannuated employees:* Two of the nine pension plans, covering about 43% of the municipal service, do not provide for the adequate relief of the superannuated. There were on June 30, 1914, out of a force of 32,994 employees, 3,323 over 60 years of age who could not be retired even if found unable to do efficient work, because they could not be reached by the inadequate provisions of the plans in question.

5. *"Excess" pensions expensive and demoralizing to service:* The existing scale of half-pay pensions after 20 years of service in the fire and street cleaning departments is unquestionably liberal. Notwithstanding this, pensions of more than one-half of salary have been granted in the discretion of the commissioners of these departments. The favoritism resulting from the use of administrative discretion is made possible by a defective law, and is illustrated by the fact that it has been applied, with few exceptions, to the higher salaried officers of the two forces. One of these "excess" pensions was \$6000 per annum granted to a high official forty-eight years old, after a service of twenty-seven years. Details of other "excess" retirements are presented on pages 32 to 34.

6. *Re-employment by city of its own pensioners an absurd practice:* The present inconsistent law is responsible for the re-employment by the city of its own pensioners and the simultaneous payment to them of pensions and salaries. On June 30, 1914, there were fifty-six policemen and firemen drawing pensions at a total annual rate of \$46,000 and at the same time drawing salaries at an annual rate of \$65,000. A detailed discussion of this phase of the city's pension system occurs on pages 34 to 44.

7. *Employees inadequately and insecurely provided for in case of injury or death resulting from performance of hazardous duty:* Although the city's responsibility for injuries resulting from the performance of duty is obvious, it is recognized only with respect to the fireman, policeman, street cleaner and health department employee. The four pension plans in question provide pensions of different proportions of salary in case of accidents under identical conditions. The widows of employees killed in the performance of duty depend upon administrative discretion for their pensions, which, with the exception of those allowed under the fire department plan, afford meagre protection against want.

8. *Vague and liberal provisions for disability not caused by performance of duty encourage early retirements:* The disability features of the various plans are not uniform in principle and were introduced without study of their possible effect in actual practice. Lack of proper definition and adequate legal and administrative safeguards, as well as high pension scales, encourage the use of disability provisions for early retirement. Of the total annual pension outlay of over \$5,000,000, at the close of 1914 approximately \$2,000,000 was a charge for disability pensions. The problem of providing for disability after it occurs, together with the closely connected and possibly more important problem of instituting preventive measures, through medical entrance examinations and supervision of the health of employees, have not received the thoughtful attention they require.

9. *Pensioning of dependents of employees whose death is not due to the performance of duty undertaken without realization of financial obligations:* Contrary to the general impression of the public, the majority of widows', children's and parents' pensions are granted to dependents of employees whose death was *not* caused by the performance of duty. Of the 2,453 dependent pensioners on the rolls on December 31, 1914, only 134, or 5.5% of the total number, drew pensions granted as a result of the death of employees in the performance of duty. The principle of pensioning dependents of employees who die from ordinary causes has been adopted in the departments of fire, police and street cleaning. The benefits are granted on the basis of need and other conditions not governed by the value of the deceased employee's service. The continuation of present provisions would probably lead to their adoption by the remaining six pension plans, involving them in heavy financial obligations. The advisability of stimulating voluntary provision by employees for their families through insurance at cost has never been thoroughly considered.

10. *Employees' participation in pension cost not general nor uniform, and not based on a consideration of principles involved:* In three plans assessments of 1%, in one plan 2%, and in another 3%, of salaries of participating employees are made for the benefit of the fund. The contributing employees provide for but a minor fraction of the cost of their pensions. No assessments are required in the remaining four of the city's pension plans.

From viewpoint of financial soundness

1. *Plans launched without knowledge of ultimate cost:* Neither at the establishment nor on the occasion of subsequent elaboration of the pension plans have cost calculations been made by qualified actuaries. The increase for a great number of years of the annually maturing claims of a pension system at a more rapid pace than the annual payroll expenditures of the corresponding active force has not been appreciated.

The present total annual pension expenditure of \$5,053,167.84 in 1914, or 4.8% of the city's payroll, will increase to a constantly higher proportion in the future. The fact that no provision is made for the accumulation at interest of adequate reserves to take care of these future increases renders the permanency of existing retirement measures exceedingly doubtful.

2. *City's support disguised by means of indirect sources of revenue:* The bulk of the income of the funds is derived from miscellaneous revenues. The amounts made available in this manner were absorbed by the funds without public realization of the actual extent of the city's support. They aggregated \$42,255,968.12, or 70.39% of the total receipts of \$60,028,272.45 of the nine pension funds from their establishment up to and including 1914.

3. *"Unlimited" funds will impose intolerable burden upon city:* Four funds are backed by the appropriating powers of the city. The excess of maturing pension claims of these funds over their regular income, derived mostly from indirect city contributions, is covered through direct taxation. Since 1904, when this practice began, up to and including the year 1914, a total of \$7,845,448.58 was obtained by the funds in question through direct taxation. This amount is but a fraction of the appropriations which will be required in the future. The two largest funds, namely, those of the police and fire departments, which up to the present have developed an annual pension charge of 16.2% and 14.1% of the respective annual expenditures of those departments for salaries, will steadily increase their demands until they will require an annual income of about 35% of the police payroll, and about 45% of the firemen's payroll, to enable them to satisfy current pension payments. The bulk of these demands will fall upon the taxpayer in the form of direct taxation. The consequent burden will become unbearable long before the ultimate development of the funds is reached.

4. *"Limited" funds will be eventually exhausted:* Five of the city's pension funds are limited in their incomes to receipts from definite sources fixed by statute. The usual experience of such funds is that, given sufficient

time, they develop pension claims in excess of their receipts. After dissipating whatever small reserves have been accumulated during the earlier years of development, the funds become bankrupt and unable to take care of new retirements.

The teachers' retirement fund is now in such a position. The health department pension fund is within a few years of disaster, having been forced to encroach in 1915, for the first time since its establishment, on its meagre accumulations of prior years. The other three "limited"¹ funds of more recent origin, though having relatively larger resources, will inevitably find themselves in the same predicament which now confronts the teachers' retirement fund.

From viewpoint of administration

1. *Lack of uniform policy for entire municipal service:* The lack of a uniform application of retirement provisions to all employees of the city is due not only to the discriminating character of the retirement laws, but also to their administration by as many independent retiring authorities as there are separate pension plans. The possibility of uniform interpretation of such retirement provisions as are identical under two or more separate plans is made difficult, if not impossible.

2. *Lack of security due to frequent changes in administration:* The frequent changes in departmental administration, considered in conjunction with the wide latitude of executive discretion in the application of retirement provisions, prevent any continuity of policy. Especially vicious in principle is the right of an administration to revoke, increase and decrease certain classes of pensions, mainly those of dependents of employees, granted by a preceding retiring authority because such revision is based on discretion and not on fixed rules defined by law. Even though this right is not extensively exercised, the mere possibility of arbitrary interference with existing benefits nullifies the main advantage of a retirement provision, namely, the security of its protection.

3. *Lack of proper record system a serious handicap to scientific fund management:* The failure of the city's pension plans to include legal provision for their financial soundness is responsible for the lack of an adequate system for the recording of data of vital importance in the calculation of fund requirements. The present actuarial valuation of the assets and liabilities of the nine funds by this Commission has been greatly delayed, and involved considerable expense, due to lack of necessary information in the wholly inadequate pension records kept. An elaborate and costly census of the municipal service had to be taken to obtain possession of basic facts which, under proper fund management, should have been not only a part of departmental records but available in digested form. The actuarial staff of the commission had to construct the necessary tables of mortality and service experience, notwithstanding the fact that the city has been operating

¹ Not backed by the power to charge deficiency to taxes.

a retirement system since the year 1857, and that without such tables it is impossible to make estimates of the cost of pension provisions. Much valuable statistical experience has been wasted by being left unrecorded in the past.

Principles to be Considered in Reorganization Plan

System must be rebuilt on new foundation

The shortcomings of New York's present pension policy are so serious as to render its continuation not only undesirable, but decidedly detrimental to the best interests of both the city and its employees. The long existence of the system without collapse under the weight of its own absurdities is due to the lack of general knowledge of the details of its operation and to the oblique methods of financing, by which its cost in the past has been hidden.

To attempt to reconcile the illogical features of the present pension plans would be like "patching old garments with new cloth." The fundamentals of a sound pension policy must be determined, and an entirely new system developed. Only if constructed in this manner may a new measure be expected to accomplish its main objects, namely, the security of the protection contemplated, and the progressive betterment of the service.

In the following outline is presented a summary of fundamental questions involved in framing a sound and equitable pension plan.

Compensation for accidents in performance of duty

1. Shall the city assume full responsibility for support in case of accidents to employees in the performance of duty?
2. Shall benefits for injury and death incurred in the performance of duty apply to all branches of the service or only to policemen, firemen, street cleaners and health department employees, as at present?

This class of benefit provision does not enter into the general pension problem. Standards of benefits accruing to the disabled employee and to his widow and children in case of his death are embodied in the Workmen's Compensation Act of the State of New York, and may be used as a basis in determining the details of similar provisions for city employees.

Sound retirement system regarded as essential prerequisite of efficient service

In large organizations, public and private, a system of retirement allowances is now generally regarded as an essential prerequisite to an efficient personnel. The recognition of its value as an important branch of employment plans is demonstrated by the rapid development of pension schemes,

especially in the last decade. The fundamental objectives of a sound measure are the advantages gained by:

1. Facilitating the discontinuance of the services of those who can not perform satisfactorily the duties of their positions because of superannuation or other forms of disability.
2. Clearing the lanes of promotion for the young and ambitious.
3. Securing adequate protection for the employee against the major risks of life, such as want in old age, disability, death, etc., which cannot be obtained by the individual through saving or commercial insurance at rates as low as a pension plan makes possible.
4. Promoting the good will of employees and inducing them to put forth their best efforts.
5. Eliminating appeals for charity and favoritism.
6. Enabling the government to compete with other public and private employers having pension systems in securing and keeping high grade men and women in public service.

By many it is claimed that the city's interest in a sound retirement system is not restricted to its concern for the efficient conduct of public business and the welfare of its personnel. It is argued that its responsibilities are far broader and require that it set a standard for other employers, and thereby extend the mutual advantages of old age and disability provisions to a constantly larger number of wage earners of the community.

Financial support of pension plan a vital question

The principal difficulty in the establishment of a retirement system after the advisability of its institution has been recognized, is a satisfactory agreement on the source or sources of its support. The question is of vital importance. The widest divergence of views exists and a great number of theories are advanced for its solution.

The extremes in the methods advocated call for the payment of the entire cost of a retirement system by either the employer or the employed. The reasoning used in support of either method is plausible. The test of any theory, however, is in its practical application. The fallacies of abstract theories become apparent through tangible defects brought out by their practical operation, and a gradual change from the theoretically perfect to the practically workable method takes place.

The commission has made a broad review of existing pension systems in operation both in the United States and abroad,¹ on which it was able to secure information. This inquiry has brought out the fact that the development of pension measures as a result of an experience of over a hundred years is in the direction of equal division of cost between the employer and the employed, and that this tendency applies equally to systems for public employees and for industrial workers.

¹ The Bureau of Municipal Research cooperated with the commission in securing and analysing data relating to the operation of foreign pension systems.

Advantages which may be derived from division of cost

The theory advanced for equal division of cost is based on the recognition of mutual responsibility on the part of the employer and the employed for existing unsatisfactory social and economic conditions under which the average wage-earner fails or is debarred from adequately protecting himself and his family against the emergencies of life. Another version of the same theory is that the operation of a sound pension plan is of as much material benefit to the employer as it is to the employee.

It is claimed that the following practical advantages result from the operation of a system which by a middle course of joint contribution reconciles extreme viewpoints embodied in the "free" and "wholly contributory" systems:

1. *Adequacy of benefits:* Adequate benefits can only be provided when financial support of a plan is derived from two sources instead of one. The practical need for two sources of income is self-evident when a pension plan is established or reorganized with full realization of the cost of assumed obligations.

2. *Security of benefits:* A system supported by the contributions of two parties to the contract has a better chance for permanency and security than a system the continuation of which depends on the free will of those who bear the entire cost. Representation of employer and employee in the management of the system tends to safeguard its equitable operation.

3. *Promotion of good will of employees:* The good will of the employee is an important advantage, which is gained by the principle of coöperation on which the system is based. The favorable effect of coöperation on the morale of the service is important.

In a "share-and-share-alike" system the contributions of an employee may be returned in case of death, resignation or dismissal. The advantages to be derived from such refund provisions are as follows:

1. *Protection to the dependents of a deceased employee:* The theory and justification of tontine features in a retirement measure do not appeal to the dependents of a deceased employee. If a return of an employee's contribution is made, the lump sum benefit is of special value to an employee's family in the heavy expense of readjustment to new conditions.

2. *Inducement to remain in service without arbitrary restriction of an employee's independence:* The disadvantage of the wholly contributory system in tempting the employee to leave in order to withdraw his accumulated salary deductions is offset in the "share-and-share-alike" system by the fact that in doing so he forfeits an equal amount of the employer's contributions, which are available to him only if he remains in the service long enough to be pensioned.

3. *Discharge of the inefficient is facilitated:* The advantage gained by the return of the employee's contributions in case of dismissal entails less expense to the retirement system than under the wholly contributory system.

In "free" pension systems where dismissal means complete loss of pension rights, the discharge of inefficient employees before they have become eligible to retirement is made difficult. The demoralizing influence of this condition on the personnel is an important consideration.

Decision necessary as to benefits

In formulating a new plan, cognizance must be taken of the heavy cost of planning any fund for the city's present great body of employees on a permanently sound basis. The necessity for compulsory application of its provisions must also be considered as it has been demonstrated by actual experience that voluntary plans are ineffective. Finally, decision must be made as to the advisability of inclusion in the plan of all necessary features by which existing disadvantageous conditions in the service may be remedied. Chiefly difficult will be the determination of effective benefits within the limits of feasible cost.

Equality in application of principles to entire service

If it is decided that the city should assume in full the responsibility for support of those who suffer injury in the performance of hazardous duty, there seems no logical reason for the extension of special privileges to any departmental subdivision of the service. The question of the advisability of variations in retirement conditions and benefits must then be considered in an entirely new light, and new lines of demarcation drawn in accordance with special conditions, such as stability of service, strain of work, differences in rates of mortality, and other considerations peculiar to various occupational groups of the city's employees.

Decision as to scope of retirement system

Before benefit provisions may be considered in detail it is necessary to decide on the general scope of the retirement system. The following groups of provisions may be considered advisable to include in the plan and are suggested as a basis for discussion:

1. *Superannuation retirement:* Retirement at an age at which the average employee may be considered as superannuated for the efficient performance of duty. This age would necessarily vary in accordance with the occupational group to which he belonged. It would, for instance, be advisable to retire a policeman or a fireman at an earlier age than a clerk or a teacher. In order to establish an equitable relation between the value of an employee's services and his retirement allowance, and to furnish him with an incentive to continue in his position as long as he is able, the amount of pension could be increased with length of service. A uniform proportion of his average yearly compensation for the last ten years for each year of completed service may be

recommended as an equitable basis for determining the amount of pension to be granted.

2. *Disability retirement:* A minimum service of 10 years is generally recognized as a proper limitation for eligibility to this class of benefits. The amount of pension could be determined on the same basis as in the case of superannuation, but at a lower proportion of the average compensation, so as to establish a safeguard against the improper use of disability provisions for early retirement. Periodical physical examinations and effective rules for the return to active duty of disability pensioners who have recovered their health are important additional safeguards which must be considered.

3. *Return of contributions:* The experience of the majority of pension funds of sufficiently long operation points to the advisability of refunding contributions to employees who leave the service before becoming eligible to pension.

Additional protection can be offered to employees at cost

As a result of a careful study of the exhaustive information obtained by the commission in the valuation of the existing pension funds of the city, there has been obtained an exceptionally reliable fact basis for offering employees protection at cost, in addition to the provisions to be included in the general compulsory retirement plan.

Of special value would be pensions to widows and orphans to supplement the lump sums accruing to the dependents of deceased employees through the return of their contributions with interest. Additional annuities and lump sum benefits could also be offered to the employee at cost, thereby placing within reach desirable terms of protection which under present conditions are either not obtainable or, if obtainable, beyond his means.

Administration and management of retirement system

An important prerequisite of a sound retirement system is a clear definition in the law itself of all important details so as to prevent the present wide latitude of administrative discretion in the interpretation of its provisions. In addition, a satisfactory decision is required as to the form and personnel of the administration and management of the system in order to guarantee its equitable and businesslike operation. Such a decision involves:

1. Freedom from considerations of departmental expediency in interpretation of the provisions of the law.

2. Uniform principle in application of retirement provisions to all employees of the municipal service.

3. Continuity of a retirement policy beyond the usual short term of administrative tenure.

4. Full responsibility for the satisfactory effect of the system, which involves the introduction of necessary amendments as soon as defects in the original law have become apparent from practical application.

5. Judicious investment of funds for the accumulation of adequate reserves.

6. Economy in management.

7. Continuous actuarial study of the various elements which affect the sufficiency of contributions to insure the payment of benefits. This involves the installation of an adequate and scientific record system by which the necessary vital and other statistics may be accumulated and studied.

8. Continuous study of the practical effect of the system on the service and the study of current development of the pension problem in this country and abroad for the purpose of improvement of the system by revision on the basis of sound precedents.

9. Continuous study of the disability phases of the system with a view to perfecting legal definitions and improving the rules for initial and subsequent examinations of disability pensioners.

It is believed that all of the above objects may best be secured by a centralized administration of the system. The first mentioned five considerations make it desirable that the interpretation of the law be entrusted to a central pension board composed in part of members who are responsible for the general financial and administrative policy of the city administration. If the system includes an extensive participation in the cost by the employees they should be adequately represented in the membership of the board.

The board should of course be equipped with a competent staff adequate to maintain suitable actuarial records and to provide the service necessary to the administration of a retirement plan affecting 80,000 or more employees and involving outlays of millions of dollars a year.

APPENDIX

ACTIVE FORCE

December 31, 1914

COMPENSATION BY

GRADE AND AVERAGE SALARY

Tables 1 to 9

SUMMARY

	Number in Active Service	Average Annual Salary	Total Annual Salary
<i>Special Departmental Pension Funds</i> ¹			
Police Pension Fund.....	10,708	\$1,405.04	\$15,045,210.00
Fire Department Relief Fund.....	5,004	1,503.78	7,524,900.00
Teachers' Retirement Fund.....	21,317	1,420.66	30,284,217.00
Health Department Pension Fund.....	1,256	1,040.18	1,306,464.00
College of the City of New York Retirement Fund.....	223	2,275.78	507,500.00
Department of Street Cleaning Relief and Pension Fund.....	5,474	835.35	4,572,686.50
Supreme Court, First Department, Retirement Fund.....	295	2,317.46	683,650.00
Supreme Court, Second Department, Retirement Fund.....	177	2,249.44	398,151.23
Total—Special Departmental Pension Funds.....	44,454	\$1,356.97	\$60,322,778.73
<i>General, City of New York employees ("Grady") Retirement Fund</i> ²			
Mechanics.....	6,064	\$1,494.01	\$9,059,650.00
Laborers, Men.....	10,841	779.43	8,449,750.00
Laborers, Women.....	1,174	380.69	446,930.00
Clerks, Men.....	9,745	1,332.62	12,986,380.00
Clerks, Women.....	2,532	866.74	2,194,590.00
Exempt Employees.....	2,500	1,796.33	4,490,830.00
Total—"Grady Law" Retirement Fund.	32,856	\$1,145.24	\$37,628,130.00
Grand Total—All Funds.....	77,310	\$1,266.99	\$97,950,908.73

¹ The figures for the special pension funds apply to the active force as of December 31, 1914, with the exception of the teachers' retirement fund indicating the active teaching force as of May 31, 1915.

² Employees covered by the provisions of this fund do not include appointive and elective officers, and temporary employees whose chances for eventual retirement are remote and improbable. The figures show the status of the force on June 30, 1914.

TABLE 1
POLICE PENSION FUND
Members of the Uniformed Force Covered by the Provisions of the Fund as of
December 31, 1914

Rank	Number in Service	Annual Salary	Total Annual Salary
Inspector.....	17	\$3,500.00	\$59,500.00
Captain.....	99	2,750.00	272,250.00
Lieutenant.....	564	2,250.00	1,269,000.00
Sergeant.....	671	1,750.00	1,174,250.00
Patrolman, 1st Grade.....	6,652	1,400.00	9,312,800.00
Patrolman, 2d Grade.....	139	1,350.00	187,650.00
Patrolman, 3rd Grade.....	203	1,250.00	253,750.00
Patrolman, 4th Grade.....	521	1,150.00	599,150.00
Patrolman, 5th, 6th, 7th Grades.....	1,739	1,000.00	1,739,000.00
Matron.....	68	1,000.00	68,000.00
Superintendent of Telegraph.....	1	4,000.00	4,000.00
Assistant Superintendent of Telegraph.....	1	3,000.00	3,000.00
Chief Lineman.....	1	1,752.00	1,752.00
Lineman.....	4 ¹	4.80 ²	7,008.00
Boiler Inspector.....	2	1,300.00	2,600.00
Surgeon.....	25	3,500.00	87,500.00
Bookkeeper.....	1	4,000.00	4,000.00
Total.....	10,708	.....	\$15,045,210.00

RECAPITULATION

Number in Service	Annual Salary	Total Annual Salary
2	\$4,000.00	\$8,000.00
42	3,500.00	147,000.00
1	3,000.00	3,000.00
99	2,750.00	272,250.00
564	2,250.00	1,269,000.00
1	1,752.00	1,752.00
4 ¹	4.80 ²	7,008.00
671	1,750.00	1,174,250.00
6,652	1,400.00	9,312,800.00
139	1,350.00	187,650.00
2	1,300.00	2,600.00
203	1,250.00	253,750.00
521	1,150.00	599,150.00
1,807	1,000.00	1,807,000.00
Total..... 10,708	.....	\$15,045,210.00

Average Salary.....\$1,405.04

¹ Based on 365 days.

² Per day.

TABLE 2

FIRE DEPARTMENT RELIEF FUND

Members of the Uniformed Force Covered by the Provisions of the Fund as of
December 31, 1914

Rank	Number in Service	Annual Salary	Total Annual Salary
Chief of Department.....	1	\$10,000.00	\$10,000.00
Deputy Chief in Charge of Brooklyn and Queens.....	1	7,500.00	7,500.00
Deputy Chief.....	14	4,200.00	58,800.00
Chief of Construction.....	1	3,300.00	3,300.00
Chief of Battalion.....	46	3,300.00	151,800.00
Captain.....	296	2,500.00	740,000.00
Lieutenant.....	412	2,100.00	865,200.00
Pilot.....	19	1,500.00	28,500.00
Engineer of Steamer.....	494	1,600.00	790,400.00
Marine Engineer.....	6	1,600.00	9,600.00
Fireman, 1st Grade.....	2,719	1,400.00	3,806,600.00
Fireman, 2nd Grade.....	108	1,200.00	129,600.00
Fireman, 3rd Grade.....	692	1,000.00	692,000.00
Fireman, 4th Grade.....	172	1,000.00	172,000.00
Fireman, on Probation.....	8	1,000.00	8,000.00
Chief Medical Officer.....	1	4,200.00	4,200.00
Medical Officer.....	10	3,300.00	33,000.00
Fire Marshal.....	2	3,000.00	6,000.00
Veterinarian.....	2	4,200.00	8,400.00
Total.....	5,004	.....	\$7,524,900.00

RECAPITULATION

Number in Service	Annual Salary	Total Annual Salary
1	\$10,000.00	\$10,000.00
1	7,500.00	7,500.00
17	4,200.00	71,400.00
57	3,300.00	188,100.00
2	3,000.00	6,000.00
296	2,500.00	740,000.00
412	2,100.00	865,200.00
500	1,600.00	800,000.00
19	1,500.00	28,500.00
2,719	1,400.00	3,806,600.00
108	1,200.00	129,600.00
872	1,000.00	872,000.00
Total.....	5,004	\$7,524,900.00

Average Salary.....\$1,503.78

TABLE 3

TEACHERS' RETIREMENT FUND

Employees Covered by the Provisions of the Fund as of May 31, 1915 ¹

Title	Men	Women	Total	Total Annual Salary Charge	Average Annual Salary Charge
Superintendent.....	33	2	35	\$192,250.00	\$5,492.86
Board of Examiners.....	4	.....	4	24,000.00	6,000.00
Supervisor and Director, Asst. Supervisor and Director, In- spector and Asst. Inspector, Special Teacher.....	189	420	609	931,255.00	1,529.15
President of Hunter College...	1	.....	1	10,000.00	10,000.00
Principal of Training School...	2	1	3	15,000.00	5,000.00
Principal of High School.....	23	.....	23	110,500.00	4,804.35
Principal of Vocational (Trade) School.....	2	1	3	12,250.00	4,083.33
Principal of Parental School...	1	.....	1	3,000.00	3,000.00
Principal of Elementary School	229	244	473	1,527,960.00	3,230.36
Principal in Charities Dept....	.....	1	1	3,500.00	3,500.00
Asst. to Principal, Elementary School.....	12	453	465	1,115,250.00	2,398.39
Teacher in Hunter College....	12	163	175	446,372.00	2,550.70
Teacher in Training School...	23	89	112	279,030.00	2,491.34
Teacher in High School.....	1,028	1,156	2,184	4,766,145.00	2,182.30
Teacher in Vocational (Trade) School.....	20	12	32	59,675.00	1,864.84
Teacher (Grade) in Elementary School.....	1,127	15,137	16,264	19,807,750.00	1,217.89
Kindergarten Teacher, Elem- entary School.....	.....	920	920	967,140.00	1,051.24
Teacher, Dept. of Charities...	.....	5	5	7,440.00	1,488.00
Teacher, Dept. of Correction..	7	.....	7	5,700.00	814.29
Total.....	2,713	18,604	21,317	\$30,284,217.00	\$1,420.66

¹ Compiled from the records of the auditor of the board of education.

TABLE 4

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Secretary.....	1	\$5,000.00	\$5,000.00
Director.....	3	5,000.00	15,000.00
Director Bureau Public Health Education...	1	5,000.00	5,000.00
Director Bureau of Child Hygiene.....	1	5,000.00	5,000.00
Director General Bacteriological Laboratory.	1	5,000.00	5,000.00
Asst. Director Genl. Bacteriological Laboratory	1	3,000.00	3,000.00
Asst. Director Genl. Bacteriological Laboratory	2	2,100.00	4,200.00
Asst. Director Genl. Bacteriological Laboratory	2	1,800.00	3,600.00
Sanitary Superintendent.....	1	5,000.00	5,000.00
Assistant Sanitary Superintendent.....	3	3,500.00	10,500.00
Bacteriological Diagnostician.....	2	1,350.00	2,700.00
Bacteriological Diagnostician.....	1	1,200.00	1,200.00
Bacteriological Diagnostician.....	1	1,050.00	1,050.00
Bacteriologist.....	3	1,800.00	5,400.00
Bacteriologist.....	7	1,500.00	10,500.00
Bacteriologist.....	5	1,200.00	6,000.00
Registrar of Records.....	1	5,000.00	5,000.00
Assistant Registrar of Records.....	5	3,000.00	15,000.00
Auditor.....	1	3,000.00	3,000.00
Clerk.....	1	3,000.00	3,000.00
Clerk.....	4	2,550.00	10,200.00
Clerk.....	1	2,400.00	2,400.00
Clerk.....	2	2,100.00	4,200.00
Clerk.....	8	1,800.00	14,400.00
Clerk.....	14	1,500.00	21,000.00
Clerk.....	23	1,200.00	27,600.00
Clerk.....	4	1,050.00	4,200.00
Clerk.....	33	900.00	29,700.00
Clerk.....	10	750.00	7,500.00
Clerk.....	11	600.00	6,600.00
Clerk.....	8	540.00	4,320.00
Clerk.....	27	480.00	12,960.00
Clerk.....	13	300.00	3,900.00
Law Clerk.....	1	2,400.00	2,400.00
Medical Clerk.....	3	1,800.00	5,400.00
Medical Clerk.....	1	1,200.00	1,200.00
Tabulator.....	1	1,800.00	1,800.00
Bookkeeper.....	5	1,200.00	6,000.00
Hospital Clerk.....	3	1,200.00	3,600.00
Hospital Clerk.....	2	900.00	1,800.00
Hospital Clerk.....	3	780.00	2,340.00
Hospital Clerk.....	2	750.00	1,500.00
Hospital Clerk.....	7	720.00	5,040.00
Hospital Clerk.....	2	600.00	1,200.00

TABLE 4 (Continued)

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Inspector of Foods.....	3	\$1,800.00	\$5,400.00
Inspector of Foods.....	3	1,500.00	4,500.00
Inspector of Foods.....	6	1,350.00	8,100.00
Inspector of Foods.....	60	1,200.00	72,000.00
Sanitary Inspector.....	1	2,550.00	2,550.00
Sanitary Inspector.....	2	1,800.00	3,600.00
Sanitary Inspector.....	10	1,500.00	15,000.00
Sanitary Inspector.....	67	1,200.00	80,400.00
Sanitary Inspector.....	1	750.00	750.00
Medical Inspector.....	1	3,000.00	3,000.00
Medical Inspector.....	6	2,550.00	15,300.00
Medical Inspector.....	1	1,950.00	1,950.00
Medical Inspector.....	11	1,800.00	19,800.00
Medical Inspector.....	59	1,500.00	88,500.00
Medical Inspector.....	132	1,200.00	158,400.00
Medical Inspector, Boro. Chief.....	1	1,800.00	1,800.00
Physician.....	2	1,800.00	3,600.00
Hospital Physician.....	3	1,200.00	3,600.00
Attending Physician.....	11	600.00	6,600.00
Assistant Attending Physician.....	1	300.00	300.00
Laboratory Assistant.....	2	1,050.00	2,100.00
Laboratory Assistant.....	12	900.00	10,800.00
Laboratory Assistant.....	15	750.00	11,250.00
Laboratory Assistant.....	7	600.00	4,200.00
Pharmacist.....	1	1,200.00	1,200.00
Chemist.....	1	2,100.00	2,100.00
Chemist.....	2	1,800.00	3,600.00
Chemist.....	3	1,500.00	4,500.00
Dentist.....	1	1,500.00	1,500.00
Dentist.....	4	1,200.00	4,800.00
Disinfector.....	7	1,050.00	7,350.00
Disinfector.....	25	900.00	22,500.00
Disinfector.....	1	750.00	750.00
Matron.....	3	900.00	2,700.00
Supervising Nurse.....	3	1,050.00	3,150.00
Social Nurse.....	1	900.00	900.00
Nurse.....	4	1,200.00	4,800.00
Nurse.....	14	1,150.00	16,100.00
Nurse.....	131	900.00	117,900.00
Nurse.....	12	720.00	8,640.00
Nurse.....	40	600.00	24,000.00
Nurse.....	1	540.00	540.00
Nurses' Assistants.....	3	480.00	1,440.00
Orderly.....	6	720.00	4,320.00

TABLE 4 (Continued)

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Orderly.....	8	\$600.00	\$4,800.00
Orderly.....	1	500.00	500.00
Orderly.....	2	480.00	960.00
Orderly.....	4	360.00	1,440.00
Orderly.....	1	300.00	300.00
Orderly.....	2	240.00	480.00
Hospital Helper.....	1	720.00	720.00
Hospital Helper.....	1	600.00	600.00
Veterinarian.....	1	1,800.00	1,800.00
Veterinarian.....	2	1,500.00	3,000.00
Veterinarian.....	8	1,200.00	9,600.00
Stenographer and Typewriter.....	1	1,200.00	1,200.00
Stenographer and Typewriter.....	1	1,050.00	1,050.00
Stenographer and Typewriter.....	6	900.00	5,400.00
Stenographer and Typewriter.....	4	750.00	3,000.00
Stenographer and Typewriter.....	1	600.00	600.00
Typewriting Copyist.....	2	900.00	1,800.00
Typewriting Copyist.....	9	750.00	6,750.00
Telephone Operator.....	7	900.00	6,300.00
Captain, Steamboat and Launches.....	1	1,630.00	1,630.00
Captain, Steamboat and Launches.....	2	1,200.00	2,400.00
Boatman.....	2	720.00	1,440.00
Boatman.....	1	600.00	600.00
Automobile Engineer.....	1	1,350.00	1,350.00
Automobile Engineer.....	6	1,200.00	7,200.00
Automobile Engineer.....	8	900.00	7,200.00
Engineer.....	11	4.50 ¹	18,067.50
Marine Engineer.....	2	4.50 ¹	3,285.00
Fireman.....	21	3.00 ¹	22,995.00
Marine Fireman.....	2	3.00 ¹	2,190.00
Bookbinder.....	2	1,200.00	2,400.00
Bookbinder Seamstress.....	1	750.00	750.00
Butcher.....	1	720.00	720.00
Carpenter.....	1	936.00	936.00
Carpenter.....	2	720.00	1,440.00
Carpenter.....	1	600.00	600.00
Carpenter.....	1	5.00 ²	1,390.00
Electrician.....	1	4.50 ³	1,408.50
Elevator Attendant.....	1	900.00	900.00
Gardener.....	1	900.00	900.00

¹ This is the rate per day and is based on 365 days.² This is the rate per day and is based on 278 days.³ This is the rate per day and is based on 313 days.

TABLE 4 (Continued)

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Gardener.....	1	\$720.00	\$720.00
Driver.....	2	840.00	1,680.00
Driver.....	2	780.00	1,560.00
Driver.....	22	720.00	15,840.00
Domestic.....	1	600.00	600.00
Domestic.....	2	360.00	720.00
Domestic.....	8	300.00	2,400.00
Domestic.....	11	240.00	2,640.00
Domestic.....	3	216.00	648.00
Janitor.....	1	750.00	750.00
Messenger.....	1	1,050.00	1,050.00
Watchman.....	2	600.00	1,200.00
Stableman.....	5	720.00	3,600.00
Stableman.....	1	600.00	600.00
Foreman of Laborers.....	1	1,500.00	1,500.00
Foreman of Laborers.....	2	1,200.00	2,400.00
Laborer.....	1	1,050.00	1,050.00
Laborer.....	10	900.00	9,000.00
Laborer.....	9	780.00	7,020.00
Laborer.....	2	732.00	1,464.00
Laborer.....	16	720.00	11,520.00
Laborer.....	3	660.00	1,980.00
Laborer.....	57	600.00	34,200.00
Helper.....	3	720.00	2,160.00
Helper.....	2	600.00	1,200.00
Helper.....	5	480.00	2,400.00
Helper.....	2	420.00	840.00
Helper.....	6	360.00	2,160.00
Helper.....	1	240.00	240.00
Cleaner.....	32	360.00	11,520.00
Total.....	1,256	.....	\$1,306,464.00

TABLE 4 (Continued)

RECAPITULATION

No. in in Service	Annual Salary	Total Annual Salary	No. in in Service	Annual Salary	Total Annual Salary
9	\$5,000.00	\$45,000.00	44	\$750.00	\$33,000.00
3	3,500.00	10,500.00	2	732.00	1,464.00
9	3,000.00	27,000.00	78	720.00	56,160.00
11	2,550.00	28,050.00	3	660.00	1,980.00
2	2,400.00	4,800.00	146	600.00	87,600.00
5	2,100.00	10,500.00	9	540.00	4,860.00
1	1,950.00	1,950.00	1	500.00	500.00
39	1,800.00	70,200.00	37	480.00	17,760.00
1	1,630.00	1,630.00	2	420.00	840.00
100	1,500.00	150,000.00	44	360.00	15,840.00
9	1,350.00	12,150.00	23	300.00	6,900.00
330	1,200.00	396,000.00	14	240.00	3,360.00
14	1,150.00	16,100.00	3	216.00	648.00
20	1,050.00	21,000.00	1	5.00 ¹	1,390.00
1	936.00	936.00	13	4.50 ²	21,352.50
242	900.00	217,800.00	23	3.00 ³	25,185.00
2	840.00	1,680.00	1	4.50 ³	1,408.50
14	780.00	10,920.00			
Total.....			1,256	.....	\$1,306,464.00
Average Salary .....			.....	.....	\$1,040.18

¹ This is the rate per day and is based on 278 days.² This is the rate per day and is based on 365 days.³ This is the rate per day and is based on 313 days.

TABLE 5

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
President.....	1	\$8,250.00	\$8,250.00
Professor and Librarian.....	1	5,500.00	5,500.00
Professor.....	13	5,000.00	65,000.00
Professor.....	2	4,750.00	9,500.00
Associate Professor.....	3	4,000.00	12,000.00
Associate Professor.....	2	3,750.00	7,500.00
Associate Professor.....	5	3,500.00	17,500.00
Associate Professor.....	1	3,350.00	3,350.00
Associate Professor.....	1	3,000.00	3,000.00
Associate Professor.....	3	2,750.00	8,250.00
Assistant Professor.....	1	3,250.00	3,250.00
Assistant Professor.....	17	2,750.00	46,750.00
Assistant Professor.....	2	2,600.00	5,200.00
Assistant Professor.....	7	2,500.00	17,500.00
Assistant Professor.....	3	2,400.00	7,200.00
Assistant Professor.....	3	2,300.00	6,900.00
Assistant Professor.....	1	2,200.00	2,200.00
Assistant Professor.....	1	2,100.00	2,100.00
Assistant Professor.....	1	2,000.00	2,000.00
Instructor.....	1	2,800.00	2,800.00
Instructor.....	6	2,750.00	16,500.00
Instructor.....	4	2,700.00	10,800.00
Instructor.....	3	2,500.00	7,500.00
Instructor.....	7	2,400.00	16,800.00
Instructor.....	9	2,300.00	20,700.00
Instructor.....	17	2,200.00	37,400.00
Instructor.....	10	2,100.00	21,000.00
Instructor.....	3	2,000.00	6,000.00
Instructor.....	4	1,900.00	7,600.00
Instructor.....	21	1,700.00	35,700.00
Special Instructor.....	1	1,000.00	1,000.00
Tutor.....	15	1,700.00	25,500.00
Tutor.....	9	1,650.00	14,850.00
Tutor.....	1	1,600.00	1,600.00
Tutor.....	7	1,550.00	10,850.00
Tutor.....	1	1,500.00	1,500.00
Tutor.....	7	1,250.00	8,750.00
Tutor.....	4	1,100.00	4,400.00
Tutor.....	16	1,000.00	16,000.00
Assistant Tutor.....	1	1,500.00	1,500.00
Assistant Tutor.....	1	1,100.00	1,100.00
Assistant Tutor.....	3	900.00	2,700.00
Assistant Tutor.....	1	600.00	600.00
Assistant Tutor.....	1	500.00	500.00
Assistant Tutor.....	2	450.00	900.00
Total.....	223		\$507,500.00

TABLE 5 (Continued)

RECAPITULATION

Number in Service	Annual Salary	Total Annual Salary	Number in Service	Annual Salary	Total Annual Salary
1	\$8,250.00	\$8,250.00	18	\$2,200.00	\$39,600.00
1	5,500.00	5,500.00	11	2,100.00	23,100.00
13	5,000.00	65,000.00	4	2,000.00	8,000.00
2	4,750.00	9,500.00	4	1,900.00	7,600.00
3	4,000.00	12,000.00	36	1,700.00	61,200.00
2	3,750.00	7,500.00	9	1,650.00	14,850.00
5	3,500.00	17,500.00	1	1,600.00	1,600.00
1	3,350.00	3,350.00	7	1,550.00	10,850.00
1	3,250.00	3,250.00	2	1,500.00	3,000.00
1	3,000.00	3,000.00	7	1,250.00	8,750.00
1	2,800.00	2,800.00	5	1,100.00	5,500.00
26	2,750.00	71,500.00	17	1,000.00	17,000.00
4	2,700.00	10,800.00	3	900.00	2,700.00
2	2,600.00	5,200.00	1	600.00	600.00
10	2,500.00	25,000.00	1	500.00	500.00
10	2,400.00	24,000.00	2	450.00	900.00
12	2,300.00	27,600.00			
Total.....			223	.....	\$507,500.00
Average Salary.....			.....	.....	\$2,275.78

TABLE 6

CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND

Employees Covered by Provisions of "Grady Law" (Exclusive of Elective and Appointive Officers and temporary employees), as of June 30, 1914 ¹

Group of Employees	Number	Total Annual Salary	Average Salary
Mechanics.....	6,064	\$9,059,650.00	\$1,494.01
Laborers:			
Men	10,841	8,449,750.00	779.43
Women	1,174	446,930.00	380.69
Clerks:			
Men	9,745	12,986,380.00	1,332.62
Women	2,532	2,194,590.00	866.74
Exempt Employees.....	2,500	4,490,830.00	1,796.33
Total.....	32,856	\$37,628,130.00	\$1,145.24

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 7
DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND
Employees Covered by the Provisions of the Fund as of December 31, 1914¹

Title	Number in Service	Annual Salary	Total Annual Salary
General Superintendent.....	1	\$3,000.00	\$3,000.00
Assistant General Superintendent.....	1	2,500.00	2,500.00
District Superintendent.....	27	2,100.00	56,700.00
Section Foreman.....	101	1,200.00	121,200.00
Stable Foreman.....	24	1,500.00	36,000.00
Assistant Stable Foreman.....	24	1,000.00	24,000.00
Assistant Foreman, 2nd Grade.....	253	900.00	227,700.00
Superintendent of Final Disposition.....	1	2,500.00	2,500.00
Asst. Supt. of Final Disposition.....	1	1,800.00	1,800.00
Dump Inspector.....	42	1,200.00	50,400.00
Assistant Dump Inspector.....	43	900.00	38,700.00
Master Mechanic.....	1	1,800.00	1,800.00
Foreman of Mechanics.....	3	1,500.00	4,500.00
Assistant Engineer ²	1	2,100.00	2,100.00
Automobile Engineman ²	4	1,200.00	4,800.00
Automobile Machinist.....	1	1,200.00	1,200.00
Transitman and Computer ²	1	1,800.00	1,800.00
Draftsman ²	1	1,050.00	1,050.00
Medical Examiner ²	4	1,800.00	7,200.00
Chief Veterinarian ²	1	2,100.00	2,100.00
Veterinarian ²	6	1,500.00	9,000.00
Apothecary ²	1	1,200.00	1,200.00
Chief Clerk ²	1	3,600.00	3,600.00
Law Clerk ²	1	2,850.00	2,850.00
Payroll Clerk ²	1	3,250.00	3,250.00
Clerk ²	1	3,000.00	3,000.00
Clerk ²	1	2,700.00	2,700.00
Clerk ²	2	2,400.00	4,800.00
Clerk ²	1	2,250.00	2,250.00
Clerk ²	3	2,100.00	6,300.00
Clerk ²	2	1,950.00	3,900.00
Clerk ²	3	1,800.00	5,400.00
Clerk ²	4	1,650.00	6,600.00
Clerk ²	4	1,500.00	6,000.00
Clerk ²	2	1,350.00	2,700.00
Clerk ²	8	1,200.00	9,600.00
Clerk ²	6	1,050.00	6,300.00
Clerk ²	7	900.00	6,300.00
Clerk ²	10	750.00	7,500.00
Clerk ²	6	600.00	3,600.00
Clerk ²	2	540.00	1,080.00
Chief Bookkeeper ²	1	3,500.00	3,500.00
Switchboard Operator ²	5	900.00	4,500.00
Switchboard Operator ²	5	720.00	3,600.00
Messenger ²	2	1,200.00	2,400.00
Supervisor of Juvenile League ²	1	1,200.00	1,200.00
Guard ²	1	1,200.00	1,200.00
Stenographer and Typewriter ²	1	1,650.00	1,650.00

TABLE 7—Continued

NEW YORK DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND
Employees Covered by the Provisions of the Fund as of December 31, 1914 ¹

Title	Number in Service	Annual Salary	Total Annual Salary
Stenographer and Typewriter ²	8	\$1,200.00	\$9,600.00
Mechanic.....	4	5.50 ³	6,116.00
Mechanic.....	24	5.00 ³	33,360.00
Mechanic.....	26	4.50 ³	32,526.00
Mechanic.....	37	4.00 ³	41,144.00
Mechanic.....	3	3.75 ³	3,127.50
Sweeper.....	2,690	780.00	2,098,200.00
Section Station Keeper.....	84	780.00	65,520.00
Custodian of Yards.....	9	780.00	7,020.00
Driver.....	1,457	800.00	1,165,600.00
Hostler.....	183	800.00	146,400.00
Stableman.....	188	760.00	142,880.00
Boardman.....	35	800.00	28,000.00
Mechanics' Helper.....	102	3.00 ³	85,068.00
Stoker.....	1	3.00 ⁴	1,095.00
Total.....	5,474		\$4,572,686.50

RECAPITULATION

Number in Service	Annual Salary	Total Annual Salary	Number in Service	Annual Salary	Total Annual Salary
1.....	\$3,600.00	\$3,600.00	7	\$1,050.00	\$7,350.00
1.....	3,500.00	3,500.00	24	1,000.00	24,000.00
1.....	3,250.00	3,250.00	308	900.00	277,200.00
2.....	3,000.00	6,000.00	1,675	800.00	1,340,000.00
1.....	2,850.00	2,850.00	2,783	780.00	2,170,740.00
1.....	2,700.00	2,700.00	188	760.00	142,880.00
2.....	2,500.00	5,000.00	10	750.00	7,500.00
2.....	2,400.00	4,800.00	5	720.00	3,600.00
1.....	2,250.00	2,250.00	6	600.00	3,600.00
32.....	2,100.00	67,200.00	2	540.00	1,080.00
2.....	1,950.00	3,900.00	4	5.50 ³	6,116.00
10.....	1,800.00	18,000.00	24	5.00 ³	33,360.00
5.....	1,650.00	8,250.00	26	4.50 ³	32,526.00
37.....	1,500.00	55,500.00	37	4.00 ³	41,144.00
2.....	1,350.00	2,700.00	3	3.75 ³	3,127.50
169.....	1,200.00	202,800.00	102	3.00 ³	85,068.00
			1	3.00 ⁴	1,095.00
Total..			5,474		\$4,572,686.50

Average Salary (Clerical Force, 108).....\$1,337.89

Average Salary (Uniformed Force, 5,366)..... 825.14

Average Salary (Combined, 5,474)..... 835.35

¹ Compiled from the records of the department. ² Clerical force. ³ This is the rate per day and is based on 278 days. ⁴ This is the rate per day and is based on 365 days.

TABLE 8

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Employees of the Appellate Division, Supreme Court, and County Clerk's Office, New York County, Covered by the Provisions of the Fund as of December 31, 1914¹

Title	Number in Service	Annual Salary	Total Annual Salary
<i>Supreme Court, Appellate Division, First Dept.:</i>			
Clerk.....	1	\$6,000.00	\$6,000.00 ²
Librarian.....	1	4,000.00	4,000.00
Deputy Clerk.....	1	3,500.00	3,500.00
Stenographer.....	3	3,600.00	10,800.00
Crier.....	1	3,000.00	3,000.00
Assistant Clerk.....	3	3,000.00	9,000.00
Clerk to Justice.....	4	2,500.00	10,000.00
Attendant.....	18	1,800.00	32,400.00
Typewriter.....	1	1,800.00	1,800.00
Telephone Operator.....	1	1,200.00	1,200.00
	34	.....	\$81,700.00
<i>Supreme Court, First District:</i>			
Librarian.....	1	\$4,000.00	\$4,000.00
Special Deputy Clerk.....	6	4,000.00	24,000.00
Special Deputy Clerk.....	1	2,500.00	2,500.00 ³
Confidential Clerk, Appellate Term.....	1	4,000.00	4,000.00
Clerk to Justice.....	8	3,500.00	28,000.00
Stenographer.....	29	3,600.00	104,400.00
Interpreter.....	1	2,750.00	2,750.00
Interpreter.....	4	2,500.00	10,000.00
Special Deputy Clerk.....	20	2,500.00	50,000.00
Assistant Special Deputy Clerk.....	39	2,500.00	97,500.00
Assistant Crier.....	1	2,500.00	2,500.00
Assistant Confidential Clerk, Appellate Term.....	1	2,500.00	2,500.00
Clerk to Justice.....	2	2,500.00	5,000.00
Assistant Special Deputy Clerk.....	1	2,000.00	2,000.00 ⁴
Attendant.....	103	1,800.00	185,400.00
Telephone Operator.....	1	1,200.00	1,200.00
	219	.....	\$525,750.00
<i>County Clerk's Office, New York County:</i>			
Law Clerk.....	1	\$3,500.00	\$3,500.00
Equity Clerk.....	1	3,500.00	3,500.00
Auditor.....	1	2,600.00	2,600.00
Assistant Law Clerk.....	1	2,500.00	2,500.00
Assistant Superintendent of Indexing and Recording.....	1	2,500.00	2,500.00

¹ As shown on payrolls. ² Paid by the State of New York. ³ Receives \$5,000 also, as clerk of the Court of General Sessions. ⁴ Receives \$4,000 also, as deputy clerk of the Court of General Sessions.

TABLE 8 (Continued)

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Employees of the Appellate Division, Supreme Court, and County Clerk's Office, New York County, Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Clerk of Common Pleas and Superior Court Records.....	2	\$2,500.00	\$5,000.00
Searcher.....	1	2,400.00	2,400.00
General Clerk.....	2	2,400.00	4,800.00
General Clerk.....	3	2,100.00	6,300.00
General Clerk.....	2	2,000.00	4,000.00
General Clerk.....	1	1,800.00	1,800.00
General Clerk.....	1	1,600.00	1,600.00
General Clerk.....	10	1,500.00	15,000.00
General Clerk.....	2	1,200.00	2,400.00
Recording Clerk.....	2	1,500.00	3,000.00
Recording Clerk.....	2	1,200.00	2,400.00
Certificate Clerk.....	1	2,000.00	2,000.00
Assistant Certificate Clerk.....	1	1,500.00	1,500.00
Index Clerk.....	3	1,500.00	4,500.00
Mechanics' Lien Clerk.....	1	1,300.00	1,300.00
Custodian.....	2	1,200.00	2,400.00
Bookbinder.....	1	1,200.00	1,200.00
	42	.....	\$76,200.00
Total.....	295	.....	\$683,650.00

RECAPITULATION

Number in Service	Annual Salary	Total Annual Salary	Number in Service	Annual Salary	Total Annual Salary
1	\$6,000.00 ¹	\$6,000.00	3	\$2,400.00	\$7,200.00
9	4,000.00	36,000.00	3	2,100.00	6,300.00
32	3,600.00	115,200.00	3	2,000.00	6,000.00
11	3,500.00	38,500.00	1	2,000.00 ²	2,000.00
4	3,000.00	12,000.00	123	1,800.00	221,400.00
1	2,750.00	2,750.00	1	1,600.00	1,600.00
1	2,600.00	2,600.00	16	1,500.00	24,000.00
75	2,500.00	187,500.00	1	1,300.00	1,300.00
1	2,500.00 ³	2,500.00	9	1,200.00	10,800.00
Total.....	.....	.....	295	.....	\$683,650.00

Average Salary.....\$2,317.46

¹ Paid by the State of New York. ² Receives \$5,000 also, as clerk of the Court of General Sessions. ³ Receives \$4,000 also, as deputy clerk of the Court of General Sessions.

TABLE 9

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Employees of the Supreme Court, Second Department, Covered by the Provisions of the Fund as of December 31, 1914 ¹

Title	Number in Service	Annual Salary	Total Annual Salary Paid by N. Y. City
<i>Supreme Court, Second Department:</i>			
General Clerk.....	1	\$5,000.00	\$5,000.00
Assistant General Clerk.....	1	3,500.00	3,500.00
Clerk.....	1	4,000.00	4,000.00
Clerk.....	4	3,500.00	14,000.00
Clerk.....	11	3,000.00	33,000.00
Clerk.....	2	2,500.00	5,000.00
Assistant Clerk.....	18	2,000.00	36,000.00
Stenographer.....	11	3,600.00	39,600.00
Stenographer.....	2	2,500.00	5,000.00
Confidential Attendant.....	1	3,000.00	3,000.00
Chief Attendant.....	1	3,000.00	3,000.00
Attendant.....	13	2,000.00	26,000.00
Attendant.....	16	1,800.00	28,800.00
Attendant.....	16	1,500.00	24,000.00
Interpreter.....	4	2,500.00	10,000.00
Interpreter.....	2	1,500.00	3,000.00
Clerk to Justice.....	10	2,750.00	27,500.00
Typewriter Operator.....	1	1,500.00	1,500.00
	115	.....	\$271,900.00
<i>Supreme Court, Appellate Term, Second Dept.:</i>			
Chief Clerk.....	1	\$3,500.00	\$3,500.00
Deputy Clerk.....	1	3,000.00	3,000.00
Confidential Clerk and Stenographer.....	1	2,500.00	2,500.00
Attendant.....	1	1,800.00	1,800.00
	4	.....	\$10,800.00
<i>Supreme Court Library in Boro. of Brooklyn:</i>			
Librarian.....	1	\$4,200.00	\$4,200.00
Assistant Librarian.....	1	2,500.00	2,500.00
Clerk.....	1	1,500.00	1,500.00
	3	.....	\$8,200.00
<i>Supreme Court, Queens County:</i>			
Special Deputy Clerk.....	1	\$3,600.00	\$3,600.00
Special Deputy Clerk.....	1	3,500.00	3,500.00
Assistant Special Deputy Clerk.....	3	2,500.00	7,500.00
Chief Court Attendant.....	1	1,800.00	1,800.00
Court Attendant.....	4	1,600.00	6,400.00
Court Attendant.....	4	1,500.00	6,000.00
Interpreter.....	1	2,000.00	2,000.00
Interpreter.....	1	1,500.00	1,500.00
	16	.....	\$32,300.00
<i>Supreme Court Library, Queens County:</i>			
Librarian.....	1	\$1,650.00	\$1,650.00
Clerk.....	1	480.00	480.00
	2	.....	\$2,130.00
<i>Supreme Court, Richmond County:</i>			
Special Deputy Clerk.....	1	\$3,000.00	\$3,000.00
Special Deputy Clerk.....	1	2,500.00	2,500.00
Court Attendant.....	2	1,500.00	3,000.00
	4	.....	\$8,500.00

TABLE 9 (Continued)

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Employees of the Supreme Court, Second Department, Covered by the Provisions of the Fund as of December 31, 1914 ¹

Title	No. in Service	Annual Salary	Total Annual Salary	Portion of Total Annual Salary Paid by N. Y. City
<i>Supreme Court, Second Judicial Dist.²</i> (Excluding Kings County)				
Clerk to Justice.....	5	\$2,750.00	\$13,750.00	\$10,217.48 ³
Stenographer.....	3	3,600.00	10,800.00	9,883.10 ⁴
Stenographer.....	1	2,500.00	2,500.00	
	9	.....	\$27,050.00	\$20,100.58
<i>Supreme Court, Second Department, Appellate Division</i>				
Deputy Clerk.....	1	\$5,000.00	\$5,000.00	\$31,059.74 ⁵
Case and Consultation Clerk.....	1	3,500.00	3,500.00	
Attendant and Crier.....	1	1,800.00	1,800.00	
Confidential Attendant.....	2	1,800.00	3,600.00	
Attendant.....	8	1,800.00	14,400.00	
Confidential Clerk.....	2	4,500.00	9,000.00	
Typewriter Operator.....	2	2,000.00	4,000.00	13,160.91 ⁶
Clerk to Justice.....	7	2,500.00	17,500.00	
	24	.....	\$58,800.00	\$44,220.65
Total.....	177	.....	.....	\$398,151.23

¹ Compiled from payrolls, budget of 1915 and civil lists.

² Salaries paid by the state, which are later reimbursed by the counties included, upon the basis of taxable valuation. The appropriations by the city in the budget of 1915 are used as a basis, as the state fiscal year is from October 1, 1914 to September 30, 1915, which includes December 31, 1914.

³ Based upon appropriations for Queens and Richmond Counties of \$8,718.05 and \$1,499.43 respectively.

⁴ Based upon appropriations for Queens and Richmond Counties of \$35,189.25 and \$6,052.24 respectively for justices and stenographers. The appropriation was made upon the basis of \$37,500.00 for justices and \$18,000.00 for stenographers for the year. As the total salary of the stenographers on December 31, 1914, was \$10,300.00, the proportionate annual salary charge against the city of New York was \$8,432.74 for Queens and \$1,450.36 for Richmond.

⁵ Based upon appropriation of \$32,508.90 for the counties of Kings, Queens and Richmond. The total appropriation of the state of \$43,226.92 included \$1,926.92 for deficiencies; the annual charge, therefore, was \$41,300.00, and the proportionate part of the same chargeable against the city of New York was \$31,059.74, distributable among counties as follows: Kings County—\$23,371.66; Queens County—\$6,559.84; Richmond County—\$1,128.24.

⁶ Based upon appropriation for Kings, Queens and Richmond Counties of \$9,903.24, \$2,779.61 and \$478.06 respectively.

TABLE 9—Continued

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Employees of the Supreme Court, Second Department, Covered by the Provisions of the
Fund as of December 31, 1914

RECAPITULATION ¹

Number in Service	Annual Salary	Total Annual Salary	Portion of Total Annual Salary Paid by City
1	\$5,000.00	.....	\$5,000.00
1	4,200.00	.....	4,200.00
1	4,000.00	.....	4,000.00
12	3,600.00	.....	43,200.00
7	3,500.00	.....	24,500.00
15	3,000.00	.....	45,000.00
10	2,750.00	.....	27,500.00
14	2,500.00	.....	35,000.00
32	2,000.00	.....	64,000.00
18	1,800.00	.....	32,400.00
1	1,650.00	.....	1,650.00
4	1,600.00	.....	6,400.00
27	1,500.00	.....	40,500.00
1	480.00	.....	480.00
144	.....	.....	\$333,830.00
5	\$2,750.00	\$13,750.00	\$10,217.48
3	3,600.00	10,800.00	9,883.10
1	2,500.00	2,500.00	
1	5,000.00	5,000.00	31,059.74
2	4,500.00	9,000.00	
1	3,500.00	3,500.00	13,160.91
2	2,000.00	4,000.00	
11	1,800.00	19,800.00	13,160.91
7	2,500.00	17,500.00	
33	.....	.....	\$64,321.23
Total..... 177	.....	.....	\$398,151.23

Average Salary..... \$2,249.44

¹ The active force is summarized in two sections, only a portion of the salaries of those included in the second section being paid by the city. The figures in the final column represent the amount paid by the city, based upon the amount appropriated for the counties of Kings, Queens and Richmond.

ACTIVE FORCE

June 30, 1914

DISTRIBUTION BY

PRESENT AGE AND LENGTH OF SERVICE

Tables 10 to 18

SUMMARY:

Pension Fund	Active Force June 30, 1914	Employees Eligible to Retirement		
		Conditions of Retirement	Number	Per Cent. of Active Force
1. Police Pension Fund.....	10,783	25 years' service if 55 years old	304	2.82
2. Fire Department Relief Fund	5,009	20 years' service	422	8.42
3. Teachers' Retirement Fund.	20,588		979 ¹	4.76
Men.....	2,608	30 years' service	50 ¹	1.92
Women.....	17,980	30 years' service	929 ¹	5.17
4. Health Dept. Pension Fund.	1,262		50	3.96
Men.....	867	20 years' service	46	5.31
Women.....	395	20 years' service	4	1.01
5. College of the City of N. Y. Retirement Fund.....	218	20 years' service	33	15.14
6. City of New York Employees' ("Grady"), Exclusive of Appointive and Elective, Retirement Fund	32,856	30 years' service, if disabled ²	322 ³	0.98
7. Department of Street Cleaning Relief and Pension Fund.....	5,426	20 years' service, if 60 years old.....	70	1.29
8. Supreme Court, First Dept., Retirement Fund.....	294	25 years' service.....	46	15.65
9. Supreme Court, Second Dept., Retirement Fund.....	138	25 years' service, if disabled.....	5	3.62
Total—All Funds.....	76,574		2,231	2.90

¹ Excluding teachers whose 30 years' service includes "outside" teaching experience.

² Civil War Veterans may retire after 20 years' service if disabled.

³ Eighty-seven veterans who have more than 20 and less than 30 years are included in this number.

TABLE 10

POLICE PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
20 years and less than 25 years.....	386	386	....	....	....	....	....
25 years and less than 30 years.....	1,860	1,484	376	....	....	....	....
30 years and less than 35 years.....	2,724	700	1,829	195	....	....	....
35 years and less than 40 years.....	2,112	39	1,028	956	89	....	....
40 years and less than 45 years.....	1,418	9	48	550	744	66	1
45 years and less than 50 years.....	1,059	1	5	40	555	410	48
50 years and less than 55 years.....	805	1	4	7	110	342	341
55 years and less than 60 years.....	321	....	....	....	7	87	227
60 years and less than 65 years.....	71	....	....	2	1	10	58
65 years and less than 70 years.....	21	....	....	....	3	4	14
70 years and less than 75 years.....	6	....	....	....	....	1	5
Total.....	10,783	2,620	3,290	1,750	1,509	920	694

Average age of entrants during six-year period ending June 30, 1914.....25.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 11

FIRE DEPARTMENT RELIEF FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
20 years and less than 25 years.....	277	277	....	....	....	....	....
25 years and less than 30 years.....	916	733	182	1	....	....	....
30 years and less than 35 years.....	1,222	266	746	210	....	....	....
35 years and less than 40 years.....	1,221	4	492	655	70	....	....
40 years and less than 45 years.....	682	....	6	237	391	48	....
45 years and less than 50 years.....	370	....	3	2	219	121	25
50 years and less than 55 years.....	185	2	....	2	69	49	63
55 years and less than 60 years.....	90	....	....	....	15	9	66
60 years and less than 65 years.....	34	....	....	....	5	....	29
65 years and less than 70 years.....	9	....	....	....	....	....	9
70 years and less than 75 years.....	3	....	....	....	....	1	2
Total.....	5,009	1,282	1,429	1,107	769	228	194

Average age of entrants during six-year period ending June 30, 1914.....25.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 12

TEACHERS' RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN

Present Age	Total	Length of Service ²						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
20 yrs. and less than 25 yrs.	165	161	4	....	....	....	....	....
25 yrs. and less than 30 yrs.	542	229	290	23	....	....	....	....
30 yrs. and less than 35 yrs.	529	80	203	239	7	....	....	....
35 yrs. and less than 40 yrs.	466	73	136	129	125	3	....	....
40 yrs. and less than 45 yrs.	360	33	91	108	97	30	1	....
45 yrs. and less than 50 yrs.	232	8	41	60	75	25	22	1
50 yrs. and less than 55 yrs.	141	....	6	28	50	26	24	7
55 yrs. and less than 60 yrs.	77	....	2	13	17	15	16	14
60 yrs. and less than 65 yrs.	68	....	....	7	21	11	13	16
65 yrs. and less than 70 yrs.	28	....	....	1	7	2	6	12
Total.....	2,608	584	773	608	399	112	82	50

Average age of entrants during six-year period ending June 30, 1914.26.8 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.² Not including teaching experience outside of city of New York schools.

TABLE 12a

TEACHERS' RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

WOMEN

Present Age	Total	Length of Service ²						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
17 yrs. and less than 20 yrs....	16	16	....	....	....	....	....	....
20 yrs. and less than 25 yrs....	3,305	3,217	88	....	....	....	....	....
25 yrs. and less than 30 yrs....	4,110	1,408	2,519	183	....	....	....	....
30 yrs. and less than 35 yrs....	3,145	247	1,022	1,696	179	1	....	....
35 yrs. and less than 40 yrs....	2,655	178	385	671	1,261	160	....	....
40 yrs. and less than 45 yrs....	1,999	96	249	345	453	738	116	2
45 yrs. and less than 50 yrs....	1,299	17	66	215	185	217	495	104
50 yrs. and less than 55 yrs....	790	4	9	81	104	74	138	380
55 yrs. and less than 60 yrs....	414	1	1	19	37	58	34	264
60 yrs. and less than 65 yrs....	192	....	....	12	11	11	15	143
65 yrs. and less than 70 yrs....	51	1	....	4	4	4	5	33
70 yrs. and less than 75 yrs....	4	....	....	....	....	1	....	3
Total.....	17,980	5,185	4,339	3,226	2,234	1,264	803	929

Average age of entrants during six-year period ending June 30, 1914..... 23.5 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.² Not including teaching experience outside of city of New York schools.

TABLE 13

HEALTH DEPARTMENT PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
15 yrs. and less than 20 yrs.....	15	15	....	....	....	....	....
20 yrs. and less than 25 yrs.....	64	44	20	....	....	....	....
25 yrs. and less than 30 yrs.....	70	26	26	18	....	....	....
30 yrs. and less than 35 yrs.....	124	38	59	17	10	....	....
35 yrs. and less than 40 yrs.....	155	41	54	31	25	4	....
40 yrs. and less than 45 yrs.....	160	24	54	42	35	5	....
45 yrs. and less than 50 yrs.....	105	10	25	22	37	10	1
50 yrs. and less than 55 yrs.....	69	6	24	19	15	5	....
55 yrs. and less than 60 yrs.....	51	6	13	14	10	4	4
60 yrs. and less than 65 yrs.....	26	1	9	6	5	1	4
65 yrs. and less than 70 yrs.....	15	1	3	4	4	....	3
70 yrs. and less than 75 yrs.....	10	....	2	1	3	3	1
75 yrs. and less than 80 yrs.....	1	....	....	....	1	....	....
80 yrs. and less than 85 yrs.....	2	....	....	1	....	....	1
Total.....	867	212	289	175	145	32	14

Average age of entrants during six-year period ending June 30, 1914. . . . 30.7 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 13a

HEALTH DEPARTMENT PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

WOMEN

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
Less than 20 yrs.....	2	2	....	....	....	....	....
20 yrs. and less than 25 yrs.....	10	6	4	....	....	....	....
25 yrs. and less than 30 yrs.....	45	14	29	2	....	....	....
30 yrs. and less than 35 yrs.....	78	32	35	9	2	....	....
35 yrs. and less than 40 yrs.....	86	40	29	16	1	....	....
40 yrs. and less than 45 yrs.....	76	26	31	14	3	2	....
45 yrs. and less than 50 yrs.....	48	11	14	13	9	....	1
50 yrs. and less than 55 yrs.....	35	3	14	13	4	....	1
55 yrs. and less than 60 yrs.....	11	2	4	2	3	....	....
60 yrs. and less than 65 yrs.....	3	....	1	2	....	....	....
65 yrs. and less than 70 yrs.....	1	....	....	....	1	....	....
Total.....	395	136	161	71	23	2	2

Average age of entrants during six-year period ending June 30, 1914.....31.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 14

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
20 years and less than 25 years.....	11	11	..	..	..	..	..
25 years and less than 30 years.....	25	11	12	2	..	..	..
30 years and less than 35 years.....	43	7	20	15	1	..	..
35 years and less than 40 years.....	42	1	21	12	8	..	..
40 years and less than 45 years.....	37	1	10	15	4	7	..
45 years and less than 50 years.....	28	..	10	8	4	1	3
50 years and less than 55 years.....	13	..	1	4	2	..	6
55 years and less than 60 years.....	2	..	..	..	..	..	2
60 years and less than 65 years.....	7	..	3	..	..	1	3
65 years and less than 70 years.....	7	..	..	1	..	2	4
70 years and less than 75 years.....	4	..	..	1	..	..	3
75 years and less than 80 years.....	1	..	..	..	..	..	1
Total.....	218	31	77	58	19	11	22

Average age of entrants during six-year period ending June 30, 1914.27.7 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN LABORERS

Present Age	Total	Length of Service						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
15 years and less than 20 years..	17	17	....	....	....	....	....	....
20 years and less than 25 years..	156	151	5	....	....	....	....	....
25 years and less than 30 years..	716	555	160	1	....	....	....	....
30 years and less than 35 years..	1,158	612	483	62	1	....	....	....
35 years and less than 40 years..	1,378	599	583	162	30	4	....	....
40 years and less than 45 years..	1,457	546	601	217	86	7	....	....
45 years and less than 50 years..	1,486	514	561	249	132	24	6	....
50 years and less than 55 years..	1,386	413	507	248	153	42	19	4
55 years and less than 60 years..	1,191	310	409	222	172	53	20	5
60 years and less than 65 years..	772	158	244	186	120	29	22	13
65 years and less than 70 years..	577	86	135	152	131	37	20	16
70 years and less than 75 years..	389	45	81	101	95	32	23	12
75 years and less than 80 years..	121	5	14	34	47	8	3	10
80 years and less than 85 years..	29	1	5	9	8	5	....	1
85 years and over.....	8	1	....	2	2	....	1	2
Total.....	10,841	4,013	3,788	1,645	977	241	114	63

Average age of entrants during six-year period ending June 30, 1914.....39.0 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15a

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

WOMEN LABORERS

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 to 30 Inclusive
16 years and less than 20 years.....	98	98	..	..	..	..	..
20 years and less than 25 years.....	114	106	8	..	..	..	..
25 years and less than 30 years.....	84	70	12	2	..	..	..
30 years and less than 35 years.....	83	47	28	5	3	..	..
35 years and less than 40 years.....	115	70	37	5	3	..	..
40 years and less than 45 years.....	166	77	55	23	8	2	1
45 years and less than 50 years.....	187	69	60	29	24	3	2
50 years and less than 55 years.....	151	41	48	22	31	7	2
55 years and less than 60 years.....	92	13	19	14	31	7	8
60 years and less than 65 years.....	51	6	10	3	16	10	6
65 years and less than 70 years.....	22	3	1	3	8	2	5
70 years and less than 75 years.....	6	..	1	1	2	1	1
75 years and less than 80 years.....	3	..	..	..	1	1	1
80 years and less than 85 years.....	2	1	..	1	..	..	..
Total.....	1,174	601	279	108	127	33	26 ²

Average age of entrants not developed.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.² Seven of these have over 30 years' service.

TABLE 15b

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN CLERKS

Present Age	Total	Length of Service						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
15 years and less than 20 years..	390	390	....	....	....	....	....	....
20 years and less than 25 years..	1,153	1,046	107	....	....	....	....	....
25 years and less than 30 years..	1,403	1,032	329	42	....	....	....	....
30 years and less than 35 years..	1,544	813	590	121	19	1	....	....
35 years and less than 40 years..	1,258	560	442	175	75	6	....	....
40 years and less than 45 years..	1,097	401	309	214	147	24	2	....
45 years and less than 50 years..	864	244	206	178	181	38	17	....
50 years and less than 55 years..	689	165	156	117	185	41	19	6
55 years and less than 60 years..	514	107	91	91	133	40	33	19
60 years and less than 65 years..	329	45	58	56	96	36	21	17
65 years and less than 70 years..	237	26	43	50	72	22	9	15
70 years and less than 75 years..	186	19	19	26	58	25	21	18
75 years and less than 80 years..	68	3	3	9	31	7	8	7
80 years and less than 85 years..	9	2	2	....	5	....	....	....
85 years and less than 90 years..	4	....	....	1	1	1	....	1
Total.....	9,745	4,853	2,355	1,080	1,003	241	130	83

Average age of entrants during six-year period ending June 30, 1914.....30.4 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15c

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

WOMEN CLERKS

Present Age	Total	Length of Service						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
15 years and less than 20 years..	17	17	....	....	....	....	....	....
20 years and less than 25 years..	247	230	17	....	....	....	....	....
25 years and less than 30 years..	630	508	111	11	....	....	....	....
30 years and less than 35 years..	585	353	156	68	8	....	....	....
35 years and less than 40 years..	425	241	112	46	24	2	....	....
40 years and less than 45 years..	285	145	75	46	13	4	2	....
45 years and less than 50 years..	174	64	54	28	20	4	4	....
50 years and less than 55 years..	90	28	21	23	13	2	3	....
55 years and less than 60 years..	51	15	12	8	9	3	3	1
60 years and less than 65 years..	12	....	4	2	5	....	....	1
65 years and less than 70 years..	10	1	2	4	2	....	....	1
70 years and less than 75 years..	5	....	....	2	....	....	3	....
75 years and less than 80 years..	1	....	....	....	....	1	....	....
Total.....	2,532	1,602	564	238	94	16	15	3

Average age of entrants not developed.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15d

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MECHANICS

Present Age	Total	Length of Service						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
15 years and less than 20 years..	1	1	....	....	....	....	....	....
20 years and less than 25 years..	286	284	2	....	....	....	....	....
25 years and less than 30 years..	702	584	113	5	....	....	....	....
30 years and less than 35 years..	878	432	387	55	4	....	....	....
35 years and less than 40 years..	872	315	347	174	34	2	....	....
40 years and less than 45 years..	907	283	318	208	84	12	2	....
45 years and less than 50 years..	762	177	244	184	118	27	8	4
50 years and less than 55 years..	607	150	169	119	109	31	25	4
55 years and less than 60 years..	433	84	101	97	84	26	27	14
60 years and less than 65 years..	272	42	51	55	63	28	19	14
65 years and less than 70 years..	193	24	33	43	45	18	14	16
70 years and less than 75 years..	111	8	22	25	28	12	11	5
75 years and less than 80 years..	32	3	2	6	11	4	1	5
80 years and over.....	8	1	....	2	1	1	....	3
Total.....	6,064	2,388	1,789	973	581	161	107	65

Average age of entrants during six-year period ending June 30, 1914....34.4 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15c

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

EXEMPT EMPLOYEES

Present Age	Total	Length of Service						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
15 years and less than 20 years..	66	66	....	....	....	....	....	....
20 years and less than 25 years..	264	238	26	....	....	....	....	....
25 years and less than 30 years..	352	228	114	10	....	....	....	....
30 years and less than 35 years..	343	220	85	31	6	1	....	....
35 years and less than 40 years..	332	201	75	42	9	5	....	....
40 years and less than 45 years..	353	181	86	37	39	7	3	....
45 years and less than 50 years..	279	123	66	53	28	8	1	....
50 years and less than 55 years..	217	78	54	36	28	12	6	3
55 years and less than 60 years..	134	52	27	31	18	3	3	....
60 years and less than 65 years..	70	22	16	15	10	3	....	4
65 years and less than 70 years..	56	12	7	8	15	4	5	5
70 years and less than 75 years..	25	6	2	5	4	5	1	2
75 years and less than 80 years..	7	1	....	5	1	....	....	....
80 years and less than 85 years..	2	....	....	1	1	....	....	....
Total.....	2,500	1,428	558	274	159	48	19	14

Average age of entrants not developed.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15f

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND
Active Force as of June 30th, 1914, Classified by Age and Length of Service ¹

CIVIL WAR VETERANS ²

Present Age	Total	Length of Service						
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
60 years and less than 65 years..	10	....	6	2	....	1	....	1
65 years and less than 70 years..	218	27	46	44	74	11	6	10
70 years and less than 75 years	324	32	57	66	99	37	22	11
75 years and less than 80 years	90	4	9	22	41	5	2	7
80 years and less than 85 years	13	1	1	4	5	2	....	....
85 years and over.....	2	....	....	1	....	1	....	....
Total.....	657	64	119	139	219	57	30	29

¹Compiled by mechanical tabulation of census cards taken on June 30, 1914.

²These Civil War veterans have also been included in the preceding tables 15 to 15 a.

TABLE 16

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
17 years and less than 20 years.....	1	1	....	....	....	....	....
20 years and less than 25 years.....	122	122	....	....	....	....	....
25 years and less than 30 years.....	456	381	74	1	....	....	....
30 years and less than 35 years.....	584	314	211	57	2	....	....
35 years and less than 40 years.....	812	341	238	167	64	2	....
40 years and less than 45 years.....	929	244	292	183	180	29	1
45 years and less than 50 years.....	844	176	237	171	208	46	6
50 years and less than 55 years.....	814	90	233	160	266	57	8
55 years and less than 60 years.....	502	34	132	108	185	35	8
60 years and less than 65 years.....	259	9	39	53	109	38	11
65 years and less than 70 years.....	83	2	16	22	26	14	3
70 years and less than 75 years.....	15	....	1	4	7	2	1
75 years and less than 80 years.....	3	....	2	....	1	....	....
80 years and less than 85 years.....	2	....	....	....	1	....	1
Total.....	5,426	1,714	1,475	926	1,049	223	39

Average age of entrants during six-year period ending June 30, 1914.....33.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 17

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

Present Age	Total	Length of Service ²					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
20 years and less than 25 years.....	1	1	....	....	....	....	....
25 years and less than 30 years.....	10	6	3	1	....	....	....
30 years and less than 35 years.....	27	11	13	3	....	....	....
35 years and less than 40 years.....	24	4	12	8	....	....	....
40 years and less than 45 years.....	44	5	8	10	12	9	....
45 years and less than 50 years.....	45	4	11	8	13	6	3
50 years and less than 55 years.....	42	1	7	5	10	11	8
55 years and less than 60 years.....	49	1	6	4	13	10	15
60 years and less than 65 years.....	18	....	3	3	4	2	6
65 years and less than 70 years.....	20	1	....	2	6	6	5
70 years and less than 75 years.....	9	....	....	1	2	....	6
75 years and less than 80 years.....	3	....	....	....	....	....	3
80 years and less than 85 years.....	1	....	....	....	1	....	....
85 years and less than 90 years.....	1	....	....	....	....	1	....
Total.....	294	34	63	45	61	45	46

Average age of entrance of employees of the Supreme Courts, first and second departments, during six-year period ending June 30, 1914.....39.3 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Twelve years' maximum of prior service included.

TABLE 18

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

Present Age	Total	Length of Service					
		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over
25 years and less than 30 years.....	2	2	....	....	....	....	....
30 years and less than 35 years.....	15	11	4	....	....	....	....
35 years and less than 40 years.....	28	15	10	2	1	....	....
40 years and less than 45 years.....	20	10	6	....	4	....	....
45 years and less than 50 years.....	22	6	8	3	5	....	....
50 years and less than 55 years.....	13	1	5	1	3	3	....
55 years and less than 60 years.....	5	1	3	....	1	....	....
60 years and less than 65 years.....	8	....	1	....	3	1	3
65 years and less than 70 years.....	11	3	4	1	2	1	....
70 years and less than 75 years.....	10	2	4	....	2	1	1
75 years and less than 80 years.....	4	....	1	1	....	1	1
Total.....	138	51	46	8	21	7	5

Average age of entrance of employees of the Supreme Court, first and second departments, during the six-year period ending June 30, 1914.....39.3 years,

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

SEPARATION OF EMPLOYEES FROM ACTIVE SERVICE

Tables 19 to 21

TABLE 19

NUMBER OF EMPLOYEES WHO SEPARATED FROM ACTIVE SERVICE WITH AND WITHOUT PENSION DURING THE SIX-YEAR PERIOD FROM JULY 1, 1908, TO JUNE 30, 1914¹

Pension Fund	Employees in Active Service on June 30, 1914	Employees Who Separated From Active Service Without Pension			Employees Who Retired From Service With Pension			Total Number of Separations During 6 Years Ending June 30, 1914
		Resignations	Dismissals	Deaths	"Superannuation" Retirements	"Disability in Performance of Duty" Retirements	"Ordinary Disability" Retirements	
1. Police Pension Fund.....	10,788	311	551	450	373	89	1,306	2,980
2. Fire Department Relief Fund.....	5,009	95	133	161	354	15	180	933
3. Teachers' Retirement Fund:								
Men.....	2,608	239	4	56	54	.....	11	364
Women.....	17,980	3,103	9	363	533	.....	208	4,313
4. Health Department Pension Fund:								
Men.....	887	366	23	44	54	5	.....	493
Women.....	395	307	11	9	3	.....	.....	339
5. College of the City of New York Retirement Fund.....	318	80	.....	6	3	.....	.....	89
6. New York City Employees' ("Grady") Retirement Fund:								
Laborers, Men.....	10,841	3,719	1,945	1,377	.....	.....	39	6,980
Laborers, Women.....	1,174	288	46	57	.....	.....	1	392
Clerks, Men.....	9,745	4,393	690	608	.....	.....	40	5,531
Clerks, Women.....	2,533	673	68	35	.....	.....	5	781
Mechanics.....	6,094	2,449	599	499	.....	.....	31	3,698
Exempt Employees.....	2,500	(*)	(*)	(*)	.....	.....	(*)	(*)
7. Department of Street Cleaning Relief and Pension Fund.....	5,426	517	1,673	487	26	7	365	3,075
8. Supreme Court, First Department, Retirement Fund.....	294	.....	.....	3	.....	.....	9	13
9. Supreme Court, Second Department, Retirement Fund.....	138	.....	.....	17	.....	.....	1	18
Total, All Funds (Exclusive of Elective and Appointive)...	76,574	16,639	5,647	4,251	1,398	116	2,096	30,047

¹ Compiled by mechanical tabulation of census cards covering period of six years from July 1, 1908, to June 30, 1914.

² The experience of exempt employees has not been separately treated.

TABLE 20

POLICE PENSION FUND

Number of Members of the Uniformed Force Who Withdrew from the Active Service for Various Causes During the Years 1900 to 1914 (inclusive) ¹

Year	Death	Retire- ment	Resig- nation	Dis- missal	Total With- drawals	Strength of Force ²
1900.....	92	44	11	21	168	7,427
1901.....	116	71	11	32	230	7,511
1902.....	79	134	21	88	322	7,674
1903.....	79	194	34	91	398	8,176
1904.....	91	153	17	23	284	8,273
1905.....	77	255	28	45	405	8,860
1906.....	73	311	49	53	486	8,874
1907.....	91	228	71	80	470	9,462
1908.....	82	160	37	166	445	10,013
1909.....	67	255	34	131	487	10,183
1910.....	84	227	37	66	414	10,178
1911.....	78	360	75	80	593	10,208
1912.....	73	298	74	113	558	10,374
1913.....	61	390	107	95	653	10,844
1914.....	79	118	65	68	330	10,708
Total.....	1,222	3,198	671	1,152	6,243	.....

¹ Compiled from annual reports of the department.

² As of December 31 of the years indicated.

TABLE 20a

POLICE PENSION FUND

Number of Members of the Uniformed Force Who Died During the Years 1900 to 1914
(inclusive) ¹

Year	Number of Deaths			Strength of Force ²
	In Performance of Duty	Other Causes	Total	
1900.....	3	89	92	7,427
1901.....	1	115	116	7,511
1902.....	2	77	79	7,674
1903.....	3	76	79	8,176
1904.....	5	86	91	8,273
1905.....	4	73	77	8,860
1906.....	3	70	73	8,874
1907.....	5	86	91	9,462
1908.....	3	79	82	10,013
1909.....	2	65	67	10,183
1910.....	2	82	84	10,178
1911.....	1	77	78	10,208
1912.....	3	70	73	10,374
1913.....	7	54	61	10,844
1914.....	7	72	79	10,708
Total.....	51	1,171	1,222	.....

¹ Compiled from the annual reports of the department.

² As of December 31st of the years indicated.

TABLE 21

FIRE DEPARTMENT RELIEF FUND

Number of Members of the Uniformed Force Who Withdrew from the Active Service for Various Causes, During the Years 1900 to 1914 (inclusive) ¹

Year	Death	Retire- ment	Resigna- tion	Dismissal	Total With- drawals	Strength of Force ²
1900.....	25	53	2	22	102	2,438
1901.....	28	65	14	18	125	2,596
1902.....	25	66	9	25	125	2,622
1903.....	24	57	31	8	120	2,982
1904.....	36	46	25	16	123	3,296
1905.....	34	28	49	19	130	3,565
1906.....	22	59	17	34	132	3,797
1907.....	40	73	37	20	170	4,118
1908.....	23	63	19	37	142	4,247
1909.....	27	85	13	18	143	4,352
1910.....	29	112	37	19	197	4,324
1911.....	19	110	8	13	150	4,422
1912.....	22	76	12	22	132	4,417
1913.....	33	111	57	23	224	4,956
1914.....	32	61	22	31	146	5,004
Total.....	419	1,065	352	325	2,161	....

¹ Compiled from the annual reports of the department.

² As of December 31st of the years indicated.

TABLE 21a

FIRE DEPARTMENT RELIEF FUND

Number of Members of the Uniformed Force Who Died During the Years 1865 to 1914
(inclusive) ¹

Year	Number of Deaths			Strength of Force ²
	In Perform- ance of Duty	From Other Causes	Total	
1865.....	4	..	4	555
1866.....	2	4	6	564
1867.....	1	4	5	521
1868.....	1	4	5	592
1869.....	2	6	8	599
1870.....	1	5	6	596
1871.....	1	8	9	596
1872.....	2	3	5	596
1873.....	2	9	11	651
1874.....	1	..	1	712
1875.....	3	10	13	748
1876.....	3	5	8	747
1877.....	..	7	7	752
1878.....	1	4	5	727
1879.....	3	4	7	728
1880.....	6	3	9	748
1881.....	..	7	7	769
1882.....	2	4	6	826
1883.....	1	7	8	895
1884.....	1	7	8	936
1885.....	3	13	16	943
1886.....	2	7	9	983
1887.....	4	13	17	997
1888.....	1	10	11	1,078
1889.....	1	9	10	1,082
1890.....	2	12	14	1,140
1891.....	1	14	15	1,144
1892.....	2	9	11	1,166
1893.....	..	14	14	1,165
1894.....	3	17	20	1,218
1895.....	2	15	17	1,263

TABLE 21a (Continued)

FIRE DEPARTMENT RELIEF FUND

Number of Members of the Uniformed Force Who Died During the Years 1885 to 1914
(Inclusive) ¹

Year	Number of Deaths			Strength of Force ²
	In Perform- ance of Duty	From Other Causes	Total	
1896.....	2	6	8	1,276
1897.....	3	8	11	1,236
1898.....	1	15	16	2,212
1899.....	..	20	20	2,419
1900.....	6	19	25	2,438
1901.....	6	22	28	2,596
1902.....	6	19	25	2,622
1903.....	5	19	24	2,982
1904.....	10	26	36	3,296
1905.....	8	26	34	3,565
1906.....	7	15	22	3,797
1907.....	11	29	40	4,118
1908.....	7	16	23	4,247
1909.....	3	24	27	4,352
1910.....	7	22	29	4,324
1911.....	6	13	19	4,422
1912.....	7	15	22	4,417
1913.....	5	28	33	4,956
1914.....	1	31	32	5,004
Total.....	159	607	766	.....

¹ Compiled from the annual reports of the department.

² As of December 31st of the years indicated.

PENSIONERS

December 31, 1914

DISTRIBUTION BY AMOUNTS RECEIVED

Tables 22 to 24

SUMMARY

Employees' Pensions	Number	Per Cent. of Total
\$150 and less than \$600.....	983	17.0
\$600 and less than \$800.....	3,230	55.9
\$800 and less than \$3,500.....	1,560	27.1
\$3,500 to \$6,000.....	6	....
Total.....	5,779	100.0

Average pension..... \$759.65

Total charge..... \$4,390,018.49

Dependents' Pensions	Number	Per Cent. of Total
\$50 and less than \$300.....	216	8.8
\$300 and less than \$350.....	2,129	86.9
\$350 and less than \$1,250.....	107	4.3
\$1,500.....	1	....
Total.....	2,453	100.0

Average pension..... \$305.40

Total charge..... \$749,148.00

		\$1,000 and Less Than \$1,250	\$1,250 and Less Than \$1,500	\$1,500 and Less Than \$1,750	\$1,750 and Less Than \$2,000	\$2,000 and Less Than \$2,500	\$2,500 and Less Than \$3,000	\$3,000 and Less Than \$3,500	\$3,500	\$4,200	\$5,000	\$6,000
<i>Police Pension</i>												
Former Emps	324	81	3	18	....	4	1	....	....	....	....	....
Dependents	1	....	....	....	....	....	....	....	....	....	....	....
Total...	325	81	3	18	....	4	1	....	....	....	....	....
<i>Fire Department</i>												
Former Emps	124	80	37	....	5	6	3	....	1	....	1	1
Dependents	11	....	1	....	....	....	....	....	....	....	....	....
Total...	135	80	38	....	5	6	3	....	1	....	1	1
<i>Teachers' Retire</i>												
Former Emps	98	83	45	....	6	....	1	....	....	1	....	....
<i>Health Departm</i>												
Former Emps	12	5	4	1	....	2	....	1	....	....	....	....
Dependents	....	....	....	....	....	....	....	....	....	....	....	....
Total...	12	5	4	1	....	2	....	1	....	....	....	....
<i>College of the</i>												
Fund:												
Former Emps	2	....	1	....	....	....	....	....	....	....	....	....
<i>City of New Y</i>												
Retirement F												
Former Emps	14	6	7	2	1	....	1	2	....	....	....	....
<i>Department of</i>												
Pension F												
Former Emps	6	....	....	2	....	....	....	....	....	....	....	....
Dependents	....	....	....	....	....	....	....	....	....	....	....	....
Total...	6	....	....	2	....	....	....	....	....	....	....	....
<i>Supreme Court</i>												
Fund:												
Former Emps	2	2	....	....	2	....	....	....	....	....	....	....
<i>Supreme Court</i>												
Fund:												
Former Emps	....	....	....	....	....	....	....	....	....	....	....	....
<i>Total All Pensi</i>												
Former Emps	582	257	97	23	14	12	6	3	1	1	1	1
Dependents	12	....	1	....	....	....	....	....	....	....	....	....
Total...	594	257	98	23	14	12	6	3	1	1	1	1
Per Cent	7.2	3.1	1.2	.3	.2	.1	.1	....	....	....	....	....

	\$1,250 and Less Than \$1,500	\$1,500 and Less Than \$1,750	\$1,750 and Less Than \$2,000	\$2,000 and Less Than \$2,500	\$2,500 and Less Than \$3,000	\$3,000 and Less Than \$3,500	\$3,500	\$4,200	\$5,000	\$5,000
Police F	81	3	18	....	4	1	....	....	....	....
Fire De	80	37	....	5	6	3	....	1	....	1
Teachers	83	45	....	6	....	1	....	....	1	....
Health)	5	4	1	....	2	....	1	....	....	....
College| Fund.	....	1	....	....	....	....	....	....	....	....
City of | tirement	6	7	2	1	....	1	2	....	....	....
Depart| Pensis	....	....	2	....	....	....	....	....	....	....
Supreme Fund.	2	....	....	2	....	....	....	....	....	....
Supreme Fund 4	....	....	....	....	....	....	....	....	....	....
Td	257	97	23	14	12	6	3	1	1	1
F	4.4	1.7	.4	.3	.2	.1	....	....	....	....

\$600 and Less Than \$700	\$700 and Less Than \$800	\$800 and Less Than \$900	\$900 and Less Than \$1,000	\$1,000 and Less Than \$1,250	\$1,250 and Less Than \$1,500	\$1,500 and Less Than \$1,750
23	....	....	....	1	....	....
6	22	5	5	11	....	1
....
....
34	22	5	5	12	....	1
1.3	.9	.2	.2	.5	....	....

PENSIONERS

June 30, 1914

DISTRIBUTION BY

PRESENT AGE AND CAUSE OF RETIREMENT

Tables 25 to 33

SUMMARY, BY CAUSE OF RETIREMENT

Pension Fund	Total Number of Pen- sioners	Number of				
		Service Pen- sioners	Dis- ability Pen- sioners	Widows	Chil- dren	Depend- ent Parents
1. Police Pension Fund.....	4,282	851	1,865	1,441	124	1
2. Fire Department Relief Fund..	1,686	582	317	669	70	48
3. Teachers' Retirement Fund...	1,521	1,232	289	....	....	..
Men.....	82	71	11	....	....	..
Women.....	1,439	1,161	278	....	....	..
4. Health Department Pension Fund.....	93	73	8	10	1	1
Men.....	79	71	7	....	1	..
Women.....	14	2	1	10	....	1
5. College of the City of N. Y. Retirement Fund.....	4	4	....	....	....	..
6. City of New York Employees' ("Grady") Retirement Fund.....	106	....	106	....	....	..
7. Department of Street Clean- ing Relief and Pension Fund.....	437	21	300	106	7	3
8. Supreme Court, First Depart- ment, Retirement Fund..	9	....	9	....	....	..
9. Supreme Court, Second De- partment, Retirement Fund.....	1	....	1	....	....	..
Total, All Funds.....	8,139	2,763	2,895	2,226	202	53

SUMMARY (Continued), BY PRESENT AVERAGE AGE

Pension Fund	Average Age on June 30, 1914				
	Service Pensioners	Disability Pensioners	Widows	Children	Dependent Parents
1. Police Pension Fund.....	67.0	53.1	55.3	13.2	82.0
2. Fire Department Relief Fund....	58.6	53.5	53.1	12.9	68.7
3. Teachers' Retirement Fund.....	64.9	52.0	....	....	....
Men.....	71.4	57.0	....	....	....
Women.....	64.5	51.8	....	....	....
4. Health Department Pension Fund	57.9	51.4	49.6	10.0	65.0
Men.....	58.0	53.0	....	10.0	....
Women.....	56.5	40.0	49.6	....	65.0
5. College of the City of New York Retirement Fund.....	74.8	....	....	....	....
6. City of New York Employees' ("Grady") Retirement Fund	....	71.6	....	....	....
7. Department of Street Cleaning Relief and Pension Fund....	67.9	61.8	49.9	16.3	72.7
8. Supreme Court, First Department, Retirement Fund.....	....	67.0	....	....	....
9. Supreme Court, Second Department, Retirement Fund.....	....	76.0	....	....	....

TABLE 25

POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Present Age	Total	No. of Service Pensioners	Number of Disability Pensioners			No. of Widow Pensioners	No. of Children Pensioners	No. of Dependent Parent Pensioners
			Actual Performance of Duty	Other than Actual Performance of Duty	Total Disability Pensioners			
Under 18 years.....	124	....	....	....	....	....	124	....
25 years and less than 30 years..	13	....	6	1	7	6	....	....
30 years and less than 35 years..	63	....	18	3	21	42	....	....
35 years and less than 40 years..	144	....	34	19	53	91	....	....
40 years and less than 45 years..	236	....	17	130	147	139	....	....
45 years and less than 50 years..	546	....	11	311	322	224	....	....
50 years and less than 55 years..	819	....	6	579	585	234	....	....
55 years and less than 60 years..	735	137	4	421	425	173	....	....
60 years and less than 65 years..	478	145	4	149	153	180	....	....
65 years and less than 70 years..	521	276	5	85	90	155	....	....
70 years and less than 75 years..	350	199	2	31	33	118	....	....
75 years and less than 80 years..	133	65	3	17	20	48	....	....
80 years and less than 85 years..	48	23	2	2	4	20	....	1
85 years and less than 90 years..	19	6	1	4	5	8	....	....
90 years and less than 95 years..	2	....	....	....	....	2	....	....
95 years and over.....	1	....	....	....	....	1	....	....
Total.....	4,282	851	113	1,752	1,865	1,441	124	1
Average Present Age..	....	67.0	43.9	53.7	53.1	55.3	13.2	82.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 26

FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Present Age	Total	No. of Service Pensioners	Number of Disability Pensioners			No. of Widow Pensioners	No. of Children Pensioners	No. of Dependent Parent Pensioners
			Actual Performance of Duty	Other than Actual Performance of Duty	Total Disability Pensioners			
Under 18 years.....	70	....	....	....	....	....	70	....
25 years and less than 30 years..	12	....	....	....	....	12	....	....
30 years and less than 35 years..	56	....	2	7	9	47	....	....
35 years and less than 40 years..	83	....	5	29	34	49	....	....
40 years and less than 45 years..	158	9	17	50	67	82	....	....
45 years and less than 50 years..	199	85	12	24	36	78	....	....
50 years and less than 55 years..	265	140	14	20	34	88	....	3
55 years and less than 60 years..	221	109	8	19	27	81	....	4
60 years and less than 65 years..	199	71	7	21	28	92	....	8
65 years and less than 70 years..	203	82	9	25	34	76	....	11
70 years and less than 75 years..	136	62	9	19	28	38	....	8
75 years and less than 80 years..	66	21	4	12	16	21	....	8
80 years and less than 85 years..	16	3	1	3	4	5	....	4
85 years and less than 90 years..	1	....	....	....	....	....	....	1
90 years and over.....	1	....	....	....	....	....	....	1
Total Number.....	1,686	582	88	229	317	669	70	48
Average Present Age..	....	58.6	54.3	48.9	53.5	53.1	12.9	68.7

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 27

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

MEN

Present Age	Total	Number of Service Pensioners	Total Disability Pensioners
45 years and less than 50 years.....	3	.....	3
50 years and less than 55 years.....	3	2	1
55 years and less than 60 years.....	6	2	4
60 years and less than 65 years.....	13	12	1
65 years and less than 70 years.....	12	11	1
70 years and less than 75 years.....	18	17	1
75 years and less than 80 years.....	15	15	.....
80 years and less than 85 years.....	11	11	.....
85 years and less than 90 years.....	.....	.....	.....
90 years and over.....	1	1	.....
Total.....	82	71	11
Average present age.....	69.5	71.4	57.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 27a

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement¹

WOMEN

Present Age	Total	Number of Service Pensioners	Number of Disability Pensioners
35 years and less than 40 years.....	3	.....	3
40 years and less than 45 years.....	37	.....	37
45 years and less than 50 years.....	78	2	76
50 years and less than 55 years.....	168	87	81
55 years and less than 60 years.....	269	228	41
60 years and less than 65 years.....	299	279	20
65 years and less than 70 years.....	281	269	12
70 years and less than 75 years.....	191	186	5
75 years and less than 80 years.....	87	84	3
80 years and less than 85 years.....	22	22	.....
85 years and less than 90 years.....	2	2	.....
90 years and over.....	2	2	.....
Total.....	1,439	1,161	278
Average present age.....	62.1	64.5	51.8

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 28

HEALTH DEPARTMENT PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

MEN

Present Age	Total	No. of Service Pensioners	Number of Disability Pensioners			No. of Widow Pensioners	No. of Children Pensioners	No. of Dependent Parent Pensioners
			Actual Performance of Duty	Other Than Actual Performance of Duty	Total Disability Pensioners			
Under 18 years.....	1	....	....	....	....	....	1	....
20 years and less than 25 years..	....	....	....	....	....	....	....	....
25 years and less than 30 years..	....	....	....	....	....	....	....	....
30 years and less than 35 years..	....	....	....	....	....	....	....	....
35 years and less than 40 years..	2	1	1	....	1	....	....	....
40 years and less than 45 years..	4	3	1	....	1	....	....	....
45 years and less than 50 years..	13	11	2	....	2	....	....	....
50 years and less than 55 years..	13	13	....	....	....	....	....	....
55 years and less than 60 years..	15	15	....	....	....	....	....	....
60 years and less than 65 years..	12	10	2	....	2	....	....	....
65 years and less than 70 years..	7	7	....	....	....	....	....	....
70 years and less than 75 years..	10	9	1	....	1	....	....	....
75 years and less than 80 years..	....	....	....	....	....	....	....	....
80 years and less than 85 years..	2	2	....	....	....	....	....	....
Total.....	79	71	7	....	7	....	1	....
Average present age.....	....	58.0	53.0	....	53.0	....	10.0	....

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 28a

HEALTH DEPARTMENT PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

WOMEN

Present Age	Total	No. of Service Pensioners	Number of Disability Pensioners			No. of Widow Pensioners	No. of Children Pensioners	No. of Dependent Parent Pensioners
			Actual Performance of Duty	Other Than Actual Performance of Duty	Total Disability Pensioners			
Under 18 years.....	....	....	....	....	....	....	....	....
20 years and less than 25 years..	....	....	....	....	....	....	....	....
25 years and less than 30 years..	....	....	....	....	....	....	....	....
30 years and less than 35 years..	....	....	....	....	....	....	....	....
35 years and less than 40 years..	1	....	....	....	....	1	....	....
40 years and less than 45 years..	5	....	1	....	1	4	....	....
45 years and less than 50 years..	1	....	....	....	....	1	....	....
50 years and less than 55 years..	1	1	....	....	....	....	....	....
55 years and less than 60 years..	2	....	....	....	....	2	....	....
60 years and less than 65 years..	2	1	....	....	....	1	....	....
65 years and less than 70 years..	2	....	....	....	....	1	....	1
Total.....	14	2	1	....	1	10	....	1
Average present age.....	51.0	56.5	40.0	....	40.0	49.6	....	65.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 29

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Present Age	Number of Service Pensioners
70 years and less than 75 years.....	2
75 years and less than 80 years.....	1
80 years and less than 85 years.....	1
Total.....	4
Average present age.....	74.8

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 30

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Disability Pensioners

Present Age	Total	Mechan- ics	Laborers		Clerks	
			Men	Women	Men	Women
50 years and less than 55 years...	1	1	.....	.....	.....	.....
55 years and less than 60 years...	5	1	1	.....	3	.....
60 years and less than 65 years...	10	2	1	.....	7	.....
65 years and less than 70 years...	22	9	11	.....	2	.....
70 years and less than 75 years...	36	9	11	1	15	.....
75 years and less than 80 years...	20	4	7	.....	8	1
80 years and less than 85 years...	10	.....	4	.....	5	1
85 years and over.....	2	.....	1	.....	1	.....
Total.....	106	26	36	1	41	2
Average present age.....	71.6	69.2	72.4	74.0	72.1	79.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 31

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Present Age	Total	No. of Service Pensioners	Number of Disability Pensioners			No. of Widow Pensioners	No. of Children Pensioners	No. of Dependent Parent Pensioners
			Actual Performance of Duty	Other Than Actual Performance of Duty	Total Disability Pensioners			
Under 18 years.....	7	....	....	....	....	....	7	....
20 years and less than 25 years..	....	....	....	....	....	....	....	....
25 years and less than 30 years..	2	....	....	....	....	2	....	....
30 years and less than 35 years..	5	....	....	....	....	5	....	....
35 years and less than 40 years..	13	....	1	2	3	10	....	....
40 years and less than 45 years..	32	....	1	13	14	18	....	....
45 years and less than 50 years..	31	....	1	17	18	13	....	....
50 years and less than 55 years..	49	....	....	24	24	25	....	....
55 years and less than 60 years..	52	....	1	36	37	14	....	1
60 years and less than 65 years..	94	7	....	74	74	13	....	....
65 years and less than 70 years..	89	4	2	80	82	3	....	....
70 years and less than 75 years..	44	8	....	32	32	3	....	1
75 years and less than 80 years..	15	2	....	13	13	....	....	....
80 years and less than 85 years..	2	....	....	2	2	....	....	....
85 years and less than 90 years..	2	....	....	1	1	....	....	1
Total.....	437	21	6	294	300	106	7	3
Average Present Age.....	58.5	67.9	53.2	62.0	61.8	49.9	16.3	72.7

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 32

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Present Age	Number of Disability Pensioners
50 years and less than 55 years.....	1
55 years and less than 60 years.....	2
60 years and less than 65 years.....	.....
65 years and less than 70 years.....	3
70 years and less than 75 years.....	1
75 years and less than 80 years.....	1
80 years and less than 85 years.....	1
Total.....	9
Average present age.....	67.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 33

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Pensioner on the Rolls on June 30, 1914. Present Age and Cause of Retirement.

Number..... 1
Present Age76 years

SERVICE PENSIONERS

June 30, 1914

DISTRIBUTION BY

YEARS OF SERVICE AND AGE AT APPOINTMENT AND RETIREMENT

Tables 34 to 39

SUMMARY

Pension Fund	Pensioned Employees on the Rolls on June 30, 1914	Employees Pensioned Under "Service," "Service and Age" and "Superannuation" Provisions				
		Number	Per Cent. of Total Pension Roll	Average Age at Appointment	Average Service	Average Age at Retirement
1. Police Pension Fund.....	2,716	851	31.3	27.9	28.5	56.4
2. Fire Department Relief Fund.....	899	582	64.7	26.7	25.3	52.0
3. Teachers' Retirement Fund..	1,521	1,232	81.0	....	....	....
Men.....	82	71	86.6	33.1	33.8	66.9
Women.....	1,439	1,161	80.7	21.2	36.1	57.3
4. Health Dept. Pension Fund..	81	73	90.1	....	....	....
Men.....	78	71	91.0	31.2	23.2	54.4
Women.....	3	2	66.7	25.5	28.5	54.0
5. College of the City of N. Y. Retirement Fund.....	4	4	100.0	59.0	12.3	71.3
6. City of New York Employees' ("Grady") Retirement Fund.....	106	....	....	....	....	....
7. Dept. of Street Cleaning Relief and Pension Fund....	321	21	6.5	40.4	26.7	67.1
8. Supreme Court, First Dept., Retirement Fund.....	9	....	....	....	....	....
9. Supreme Court, Second Dept., Retirement Fund.....	1	....	....	....	....	....
Total.....	5,658	2,763	48.8	....	....	....

TABLE 34

POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years.....	11	48.5	60.3
15 years and less than 20 years.....	10	44.2	61.0
20 years and less than 25 years.....	218	27.3	48.8
25 years and over.....	612	27.4	58.9
Total.....	851	27.9	56.4

Average Service..... 28.5 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 35

FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
20 years and less than 25 years.....	337	26.9	48.4
25 years and over.....	245	26.3	57.1
Total.....	582	26.7	52.0

Average Service..... 25.3 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 36
TEACHERS' RETIREMENT FUND
MEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years.....	3 ³	57.0	70.3
15 years and less than 20 years.....	10 ³	48.3	64.9
20 years and less than 25 years.....	8 ³	40.0	62.9
25 years and less than 30 years.....	5 ³	37.6	64.6
30 years and over.....	45	26.4	68.1
Total.....	71	33.1	66.9

Average Service..... 33.8 years ²

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Includes only service in New York city schools. Twenty-six teachers were credited with "outside" experience to make them eligible for retirement.

TABLE 36a
TEACHERS' RETIREMENT FUND
WOMEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
5 years and less than 10 years.....	2 ³	53.0	61.5
10 years and less than 15 years.....	8 ³	45.9	59.1
15 years and less than 20 years.....	26 ³	39.9	56.6
20 years and less than 25 years.....	27 ³	37.3	59.6
25 years and less than 30 years.....	40 ³	30.9	58.5
30 years and over.....	1,058	19.7	57.1
Total.....	1,161	21.2	57.3

Average Service..... 36.1 years ²

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Includes only service in New York city schools. One hundred and three teachers were credited with "outside" experience to make them eligible for retirement.

TABLE 37

HEALTH DEPARTMENT PENSION FUND

MEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
20 years and less than 25 years.....	53	31.4	52.7
25 years and over.....	18	30.7	59.5
Total.....	71	31.2	54.4

Average Service..... 23.2 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 37a

HEALTH DEPARTMENT PENSION FUND

WOMEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
25 years and over.....	2	25.5	54.0

Average Service..... 28.5 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 38

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years.....	3	60.0	71.3
15 years and less than 20 years.....	1	56.0	71.0
Total.....	4	59.0	71.3

Average Service..... 12.3 years ²

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Service outside of City College not included.

TABLE 39

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
20 years and less than 25 years.....	10	43.4	64.8
25 years and over.....	11	37.7	69.1
Total.....	21	40.4	67.1

Average Service..... 26.7 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

DISABILITY (In Performance of Duty) PENSIONERS

June 30, 1914

DISTRIBUTION BY

YEARS OF SERVICE AND AGE AT APPOINTMENT AND RETIREMENT

Tables 40 to 43

SUMMARY

Pension Fund	Pensioned Employ- ees on the Rolls on June 30, 1914	Employees Pensioned Under Provisions for disability incurred in performance of duty				
		Number	Per Cent. of Total Pension Roll	Average Age at Appoint- ment	Average Service	Average Age at Retire- ment
1. Police Pension Fund.....	2,716	113	4.2	28.2	7.6	35.8
2. Fire Department Relief Fund.	899	88	9.8	27.1	14.0	41.1
3. Health Department Pension Fund.....	81	8	9.9	37.4	7.1	44.5
Men.....	78	7	9.0	38.3	8.0	46.3
Women.....	3	1	33.3	29.0	3.0	38.0
4. Department of Street Cleaning Relief and Pension Fund	321	6	1.9	42.5	10.3	52.8
Total.....	4,017	215	5.4	....	....	....

TABLE 40

POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability
Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years.....	20	25.6	28.0
5 years and less than 10 years.....	77	28.5	36.1
10 years and less than 15 years.....	12	30.2	40.3
15 years and less than 20 years.....	..	....	....
20 years and less than 25 years.....	2	25.5	48.0
25 years and over.....	2	36.0	63.5
Total.....	113	28.2	35.8

Average Service.....7.6 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 41

FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability
Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years.....	2	26.0	29.5
5 years and less than 10 years.....	25	27.2	34.4
10 years and less than 15 years.....	25	27.0	38.6
15 years and less than 20 years.....	24	26.3	42.0
20 years and less than 25 years.....	2	34.5	55.5
25 years and over.....	10	28.1	61.3
Total.....	88	27.1	41.1

Average Service.....14.0 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 42
HEALTH DEPARTMENT PENSION FUND
MEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability
Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years.....	1	33.0	36.0
5 years and less than 10 years.....	4	45.0	52.5
10 years and less than 15 years.....	1	24.0	26.0
15 years and less than 20 years.....	....	....	....
20 years and less than 25 years.....	1	31.0	52.0
Total.....	7	38.3	46.3

Average Service.....8.0 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 42a
HEALTH DEPARTMENT PENSION FUND
WOMAN

Pensioner on the Rolls on June 30, 1914, Who Was Retired for Disability Incurred in
Performance of Duty

Years of Service and Age at Appointment and Retirement

Number..... 1
Age at Appointment.....29 years
Service Prior to Retirement..... 3 years
Age at Retirement.....32 years

TABLE 43
DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability
Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years.....	1	37.0	39.0
5 years and less than 10 years.....	2	53.5	61.0
10 years and less than 15 years.....	1	33.0	46.0
15 years and less than 20 years.....	2	39.0	55.0
Total.....	6	42.5	52.8

Average Service.....10.3 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

DISABILITY (ORDINARY) PENSIONERS

June 30, 1914

DISTRIBUTION BY

YEARS OF SERVICE AND AGE AT APPOINTMENT AND RETIREMENT

Tables 44 to 50

SUMMARY

Pension Fund	Pensioned Employees on the Rolls on June 30, 1914	Employees Pensioned Under Provisions for "Ordinary" Disability, Not Incurred in Performance of Duty				
		Number	Per cent. of Total Pension Roll	Average Age at Appointment	Average Service	Average Age at Retirement
1. Police Pension Fund.....	2,716	1,752	64.5	27.4	21.2	48.6
2. Fire Dept. Relief Fund....	899	229	25.5	28.2	16.1	44.3
3. Teachers' Ret'ment Fund.	1,521	289	19.0	.....	.....	.....
Men.....	82	11	13.4	36.3	18.5	54.8
Women.....	1,439	278	19.3	24.4	24.0	48.4
4. Health Dept. Pension Fund	81	.....	.....	.....	.....	.....
Men.....	78	.....	.....	.....	.....	.....
Women.....	3	.....	.....	.....	.....	.....
5. College of the City of New York Ret'ment Fund...	4	.....	.....	.....	.....	.....
6. City of New York Employees' ("Grady") Retirement Fund.....	106	106	100.0	37.1	34.0	71.1
7. Department of Street Cleaning Relief and Pension Fund.....	321	294	91.6	44.6	16.6	61.2
8. Supreme Court, 1st Dept., Retirement Fund.....	9	9	100.0	39.0	27.2	66.2
9. Supreme Court, 2nd Dept., Retirement Fund.....	1	1	100.0	48.8	26.6	75.4
Total	5,658	2,680	47.4	.....	.....	.....

TABLE 44

POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years.....	147	28.5	41.0
15 years and less than 20 years.....	330	28.2	45.5
20 years and less than 25 years.....	948	27.4	49.1
25 years and over.....	327	25.8	53.7
Total.....	1,752	27.4	48.6

Average Service.....21.2 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914

TABLE 45

FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years.....	8	27.9	31.3
5 years and less than 10 years.....	27	30.5	37.3
10 years and less than 15 years.....	73	27.6	39.9
15 years and less than 20 years.....	75	29.1	47.1
20 years and less than 25 years.....	25	27.2	48.6
25 years and over.....	21	25.0	57.9
Total.....	229	28.2	44.3

Average Service.....16.1 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 46

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

MEN

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years.....	1 ²	53.0	66.0
15 years and less than 20 years.....	5 ²	35.2	51.4
20 years and less than 25 years.....	4	36.0	57.0
25 years and less than 30 years.....	1	26.0	52.0
Total.....	11	36.3	54.8

Average Service.....18.5 years ²

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Includes only service in New York city schools. Six teachers were credited with "outside" experience to make them eligible for retirement.

TABLE 46a

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

WOMEN

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years.....	1 ²	47.0	51.0
5 years and less than 10 years.....	4 ²	44.0	51.0
10 years and less than 15 years.....	10 ²	41.9	54.6
15 years and less than 20 years.....	30 ²	34.7	51.7
20 years and less than 25 years.....	101	22.9	44.9
25 years and less than 30 years.....	95	21.3	48.1
30 years and over.....	37	20.2	54.0
Total.....	278	24.4	48.4

Average Service.....24.0 years ²

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Includes only service in New York city schools. Forty-five teachers were credited with "outside" experience to make them eligible for retirement.

TABLE 47

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
20 years and less than 30 years.....	28	46.4	71.0
30 years and over.....	78	33.8	71.2
Total.....	106	37.1	71.1

Average Service.....34.0 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 48

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years.....	93	46.7	59.3
15 years and less than 20 years.....	134	44.2	61.3
20 years and less than 25 years.....	65	42.9	63.9
25 years and over.....	2	37.5	64.5
Total.....	294	44.6	61.2

Average Service.....16.6 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 49**SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND**

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
15 years and less than 20 years.....	1	30.0	48.0
20 years and less than 25 years.....	1	42.0	66.0
25 years and over.....	7	39.9	68.9
Total.....	9	39.0	66.2

Average Service.....27.2 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 50**SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND**

**Pensioner on the Rolls on June 30, 1914, Who Was Retired for "Ordinary" Disability.
Length of Service and Age at Appointment and Retirement**

Number..... 1
 Age at Appointment.....48.8 years
 Service Prior to Retirement.....26.6 years
 Age at Retirement.....75.4 years

RECEIPTS AND DISBURSEMENTS

1857 to 1914

ANALYZED BY

SOURCES OF INCOME AND OBJECTS OF EXPENDITURE

Tables 51 to 62

SUMMARY OF TOTALS:

Items	Since Establishment		1914	
	Amount	Per Cent. of Total	Amount	Per Cent. of Total
<i>Receipts:</i>				
Employees' Contributions..	\$7,349,058.13	12.24	\$754,724.88	14.13
Indirect City Contributions	42,255,968.12	70.39	2,803,058.60	52.47
Direct City Contributions..	7,845,448.58	13.07	1,664,552.36	31.15
Interest.....	2,271,951.22	3.79	118,594.30	2.22
Miscellaneous.....	305,846.40	.51	1,578.01	.08
Total Receipts.....	\$60,028,272.45	100.00	\$5,342,507.65	100.00
<i>Disbursements:</i>				
Pension Payments.....	\$56,783,095.94		\$5,053,167.84	
Administrative Expenses...	133,280.95		6,463.77	
Total Disbursements.....	\$56,916,376.89		\$5,059,631.61	

Balance in Funds, December 31, 1914.....\$3,111,895.56

by Sources of Income and Objects of Expenditure

Year	End of	Cent	DISBURSEMENTS				Balance at End of Year	Year
			Pension Payments	Administrative Expenses, Etc.	Total Disbursements			
					Amount	Per Cent. of Receipts		
1857	...	100	.....	.....	.....	.....	\$423.10	1857
1858	...	100	\$30.00	.....	\$30.00	1.36	2,593.10	1858
1859	...	100	240.00	.....	240.00	6.58	5,997.47	1859
1860	...	100	809.31	.....	809.31	16.12	10,211.24	1860
1861	...	100	1,425.75	\$49.28	1,475.03	14.68	18,786.36	1861
1862	...	100	2,133.32	.....	2,133.32	21.19	26,718.68	1862
1863	...	100	2,398.58	.....	2,398.58	26.06	33,523.10	1863
1864	...	100	3,877.49	29.10	3,906.59	19.73	49,418.13	1864
1865	...	100	6,680.72	.....	6,680.72	25.23	69,216.60	1865
1866	...	100	7,257.50	.....	7,257.50	16.32	106,424.40	1866
1867	...	100	7,870.54	94.50	7,965.04	25.32	129,915.99	1867
1868	...	100	12,987.13	689.00	13,676.13	42.60	148,339.97	1868
1869	...	100	18,906.64	577.00	19,483.64	53.93	164,981.11	1869
1870	...	100	26,223.83	229.12	26,452.95	35.98	212,051.38	1870
1871	...	100	45,664.36	6,867.27	52,531.63	56.04	253,251.07	1871
1872	...	100	56,329.03	14,363.40	70,691.43	63.60	293,715.42	1872
1873	...	100	63,242.22	1,234.75	64,476.97	60.97	334,993.26	1873
1874	...	100	74,984.55	2,151.45	77,136.00	54.70	398,876.25	1874
1875	...	100	64,417.71	1,826.01	66,243.72	52.97	457,697.60	1875
1876	...	100	47,691.26	1,995.23	49,686.49	42.68	524,423.12	1876
1877	...	100	80,967.99	2,718.54	83,686.53	65.41	568,675.11	1877
1878	...	100	81,470.85	2,187.25	83,658.10	53.41	641,642.95	1878
1879	...	100	96,433.42	1,115.23	97,548.65	53.35	726,923.47	1879
1880	...	100	124,996.76	112.00	125,108.76	74.22	770,335.71	1880
1881	...	100	142,641.88	144.50	142,786.38	81.78	802,204.11	1881
1882	...	100	164,009.55	141.00	164,150.55	134.34	760,246.68	1882
1883	...	100	197,909.28	407.07	198,316.35	236.92	645,636.86	1883
1884	...	100	264,049.12	794.85	264,843.97	106.90	623,543.79	1884
1885	...	100	338,528.73	91.10	338,619.83	108.35	602,459.13	1885
1886	...	100	407,601.30	119.25	407,720.55	101.32	597,134.82	1886
1887	...	100	478,722.21	2,569.18	480,292.97	86.57	671,675.87	1887

TEACHERS' RETIREMENT FUND

Receipts and Disbursements, 1894 to 1914,¹ Analyzed by Sources of Income and Objects of Expenditure

Year	RECEIPTS						DISBURSEMENTS							
	Employees' Contributions		Indirect City Contributions		Donations, Bequests, etc.		Interest		Total Receipts		Pension Payments	Administra- tive Ex- penses	Total Disbursements	
	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total			Amount	Per Cent. of Receipts
1894	.....	.....	\$25,060.33	100.	.....	.....	.....	.....	.....	\$26,060.33	100	.....	.....	.....
1895	.....	.....	62,897.08	100.	.....	.....	.....	.....	.....	62,897.08	100	.....	.....	20.09
1896	.....	.....	50,504.04	100.	.....	.....	.....	.....	.....	50,504.04	100	.....	.....	84.34
1897	\$41,283.99 ⁴	38.35	63,382.58	58.89	.....	\$2,961.81	2.76	.....	.....	107,038.38	100	71,539.49	.....	66.47
1898	23,858.34	28.47	59,213.83	70.66	.....	728.20	.87	.....	.....	83,800.37	100	.....	.....	121.90
1899	30,479.86	7.99	346,873.97	90.91	.....	4,225.28	1.10	.....	.....	381,579.11	100	.....	.....	32.57
1900	43,079.45	10.55	354,186.38	86.80	.....	10,772.76	2.65	.....	.....	406,038.69	100	.....	.....	52.58
1901	19,741.98	4.06	451,652.81	93.10	\$15.00	13,698.70	2.84	.....	.....	485,108.49	100	.....	.....	54.38
1902	.....	.10	408,769.74	96.00	.....	16,579.30	3.90	.....	.....	343,017.13	100	.....	.....	80.56
1903	.....	.....	426,453.45	91.11	300.00	41,306.77	8.83	.....	.....	468,060.22	100	.....	.....	89.73
1904	.....	.....	475,027.65	92.06	.....	40,975.63	7.94	.....	.....	516,003.28	100	.....	.....	92.93
1905	92,638.93	15.51	468,700.92	78.50	.....	36,708.15	5.99	.....	.....	597,048.00	100	.....	.....	88.18
1906	169,054.42	23.94	497,251.59	70.42	.....	39,766.84	5.64	.....	.....	706,072.85	100	.....	.....	87.38
1907	178,214.73	23.72	562,697.02	71.72	388.01	43,155.13	5.51	.....	.....	784,354.89	100	.....	.....	87.89
1908	189,410.96	24.91	532,228.47	68.70	.....	48,636.62	6.39	.....	.....	760,176.05	100	.....	.....	95.25
1909	196,489.87	22.09	647,700.81	72.11	.....	53,025.16	5.80	.....	.....	898,208.94	100	.....	.....	86.61
1910	207,630.93	26.40	527,939.13	67.14	441.87	50,328.61	6.40	.....	.....	796,340.54	100	.....	.....	106.12
1911	215,158.45	26.77	547,267.33	68.09	.....	41,308.67	5.14	.....	.....	803,734.45	100	.....	.....	109.62
1912	257,729.97	30.85	542,233.66	63.86	.....	49,224.85	5.80	.....	.....	849,198.48	100	.....	.....	115.88
1913	270,184.44	26.19	724,336.23 ⁵	70.28	.....	36,902.17	3.58	.....	.....	1,031,422.94	100	.....	.....	107.69
1914	285,257.63	26.43	746,003.92 ⁶	69.26	.....	45,881.20	4.26	.....	.....	1,077,142.64	100	.....	.....	109.93
Total	\$2,222,624.93	19.65	\$8,510,280.94	75.26	\$1,144.88	\$574,095.85	5.08	.....	.....	\$11,308,146.65	100	.....	.....	91.98

Balance December 31st, 1914. \$906,806.57

¹ As shown for the years 1894 to 1913 in the annual reports of the Teachers' Retirement Fund and for the year 1914 on the books of the Auditor of the Board of Education.

² Increase in this year due to the advance of \$200,000.00 for excise taxes.

³ Increase in this year due to the fact that the payment of refunds of absence deductions were postponed.

⁴ Includes contributions made in 1896 which could not be segregated.

TABLE 57

HEALTH DEPARTMENT PENSION FUND

Receipts and Disbursements, 1894-1914, Analyzed by Sources of Income and Objects of Expenditure

Year	Receipts					Disbursements						
	Employees' Contributions		Indirect City Contributions		Interest		Total Receipts		Pension Payments	Administrative Expenses, Premiums on Bonds, Commission, etc.	Total Disbursements	
											Amount	Per Cent. of Receipts
	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Receipts		
1894	.....	.....	\$3,884.75	99.19	\$31.86	.81	\$3,916.61	100	.....	.....	.....
1895	.....	.....	15,694.32	97.65	377.86	2.35	16,072.18	100	\$150.00	\$68.85	1.36
1896	.....	.....	23,257.00	95.63	1,019.30	4.38	23,276.30	100	1,095.00	.....	4.70
1897	.....	.....	11,796.00	99.39	1,400.19	10.61	13,196.19	100	2,460.00	.....	18.64
1898	.....	.....	12,701.84	88.24	1,692.54	11.76	14,394.38	100	4,629.90	.....	32.16
1899	.....	.....	11,375.90	85.44	1,938.42	14.56	13,314.32	100	7,115.81	.....	53.44
1900	.....	.....	20,584.49	90.41	2,183.67	9.59	22,768.16	100	7,701.29	.....	33.83
1901	.....	.....	20,590.15	88.77	2,604.60	11.23	23,194.75	100	10,539.95	35.93	45.60
1902	.....	.....	25,776.80	88.09	3,455.19	11.91	29,231.99	100	12,089.34	49.00	41.48
1903	.....	.....	29,681.29	87.39	4,280.97	12.61	33,962.26	100	13,173.29	.....	38.79
1904	.....	.....	31,656.80	84.89	5,633.29	15.11	37,290.09	100	16,590.00	.....	44.49
1905	.....	.....	43,050.29	86.15	6,922.47	13.85	49,972.76	100	18,115.06	.....	36.25
1906	.....	.....	49,071.01	85.75	8,151.39	14.25	57,222.40	100	21,205.24	.....	37.06
1907	\$4,223.87	10.05	29,224.97	69.68	8,561.13	20.37	42,018.67	100	26,571.78	.....	60.14
1908	12,734.98	34.06	15,018.75	40.17	9,633.60	25.77	37,387.33	100	29,998.14	.....	79.43
1909	15,833.97	35.79	19,046.33	43.05	9,860.02	21.16	44,240.32	100	35,804.76	.....	80.93
1910	14,936.54	38.01	15,405.91	39.21	8,950.95	22.78	39,298.40	100	38,870.61	.....	98.92
1911	14,273.40	26.70	32,950.70	61.65	6,223.06	11.64	53,447.16	100	40,160.81	7,805.00	89.74	
1912	13,434.13	20.50	40,906.25	62.43	11,196.01	17.08	66,536.39	100	45,471.73	908.00	70.15	
1913	14,440.09	15.53	66,142.10	71.11	12,432.56	13.36	93,004.75	100	54,030.74	418.75	58.54	
1914	13,363.19	14.23	66,599.00	70.79	14,092.90	14.98	94,085.09	100	78,776.65	711.25	84.49	
Total	\$103,268.87	12.80	\$583,424.65	73.31	\$120,161.98	14.89	\$806,855.50	100	\$463,950.10	\$9,593.78	58.57	
											\$473,543.88	

Balance December 31st, 1914,\$894,511.69

TABLE 58
COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND
Receipts and Disbursements, 1902-1914
Analyzed by Sources of Income and Object of Expenditure

Year	Receipts				Disbursements	
	Indirect City Contributions		Interest		Total Receipts	Total Disbursements
	Amount	Per Cent. of Total	Amount	Per Cent. of Total		
1902.....	\$53,245.83	100.00	.....	.....	\$53,245.83	\$718.74
1903.....	.....	.....	\$1,245.89	100.00	1,245.89	13,166.52
1904.....	.....	.....	1,153.57	100.00	1,153.57	17,249.80
1905.....	.....	.....	555.09	100.00	555.09	16,330.45
1906.....	25,000.00	98.26	442.00	1.74	25,442.00	13,540.18
1907.....	.....	.....	480.37	100.00	480.37	11,687.39
1908.....	25,000.00	98.64	344.23	1.36	25,344.23	12,812.37
1909.....	.....	.....	566.81	100.00	566.81	9,466.54
1910.....	.....	.....	280.79	100.00	280.79	10,449.84
1911.....	10,000.00	98.25	178.46	1.75	10,178.46	4,741.25
1912.....	.....	.....	123.13	100.00	123.13	5,736.36
1913.....	10,000.00	99.01	100.45	.99	10,100.45	5,671.71
1914.....	.....	.....	127.14	100.00	127.14	4,325.00
Total	\$123,245.83	95.65	\$5,597.93	4.35	\$128,843.76	\$125,896.15

Balances December 31st, 1914..... \$2,947.61

TABLE 59

CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND

Receipts and Disbursements, 1906-1914

Years	Receipts	Disbursements
	Excess Licenses	Pension Payments
1906.....	\$1,500.00	\$1,500.00
1907.....	1,500.00	1,500.00
1908.....	1,575.00	1,575.00
1909.....	2,225.44	2,225.44
1910.....	3,208.36	3,208.36
1911.....	8,253.64	8,253.64
1912.....	25,419.95	25,419.95
1913.....	30,957.13	30,957.13
1914.....	96,663.26	96,663.26
Total.....	\$171,302.78	\$171,302.78

TABLE 60
DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND
Receipts and Disbursements—1911 to 1914
Analyzed by Sources of Income and Objects of Expenditure

RECEIPTS										DISBURSEMENTS					
Year	Employees' Contributions		Indirect City Contributions		Donations, Bequests, etc.		Interest		Total Receipts		Pension Payments	Administrative Expense, Premium on Bonds, etc.	Total Disbursements		Year
	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent.			Amount	Per Cent. of Receipts	
1911	\$30,426.05	48.43	\$32,288.31	51.40	.....	.....	\$105.04	.17	\$63,819.40	100	\$299.77	\$187.50	\$487.27	.78	1911
1912	131,006.03	37.10	214,124.99	60.64	\$5,000.00	1.41	2,997.92	.85	353,128.94	100	15,682.21	2,279.41	17,861.62	5.06	1912
1913	132,548.39	38.78	194,585.57	56.94	.....	.....	14,614.82	4.28	341,748.78	100	114,096.38	1,811.87	115,908.25	33.92	1913
1914	134,794.06	24.53	388,363.85	70.71	4.00	.....	26,131.72	4.76	549,233.63	100	163,053.71	3,319.73	166,373.44	30.29	1914
Total ...	\$428,714.53	32.80	\$829,362.72	63.46	\$5,004.00	.38	\$43,849.50	3.36	\$1,306,930.75	100	\$293,032.07	\$7,598.51	\$300,630.58	23.00	Total

Balances December 31, 1914.....\$1,008,300.17

TABLE 61

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Receipts and Disbursements, 1911 to 1914

Analyzed by Sources of Income and Object of Expenditure

Year	Receipts							Disbursements		
	Employees' Contributions		Indirect City Contributions		Direct City Contributions for Payment of Pensions		Interest		Total Receipts	
	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent. of Total	Amount	Per Cent.
1911..	.....	.....	.....	.....	\$499.98	100.00	.....	.....	\$499.98	100.00
1912..	.....	.....	\$2,053.03	50.65	2,000.00	49.35	.....	.....	4,053.03	100.00
1913..	\$3,211.95	32.34	1,808.32	18.20	4,884.12	49.18	\$27.44	.28	9,931.83	100.00
1914..	6,086.56	35.89	4,545.38	26.80	6,277.42	37.01	51.36	.30	16,960.72	100.00
Total	\$9,298.51	29.57	\$8,406.73	26.73	\$13,661.52	43.45	\$78.80	.25	\$31,445.56	100.00
									\$22,068.25	70.18

Balance December 31, 1914.....\$9,577.51

TABLE 62

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Receipts and Disbursements, 1914, Analyzed by Source of Income and Object of Expenditure

	Receipts	Disbursements
Year	Special Revenue Bond Appropriation	Pension Payment
1914.....	\$900.00	\$900.00

PAY AND PENSION ROLLS

1905 to 1914

COMPARISON OF ACTIVE FORCE AND PENSIONERS

AND OF

PAY AND PENSION ROLLS

Tables 63 to 71

SUMMARY

Pension Fund	Year Fund Es- tab- lished	Proportion of Pensions to Payroll During the Years Indicated									
		1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
1. Police Pension Fund.....	1857	11.4	11.3	12.1	12.1	12.2	12.4	13.0	14.5	15.7	16.2
2. Fire Department Relief Fund	1871	11.8	11.3	11.3	11.3	11.6	12.1	13.1	14.4	13.9	14.1
3. Teachers' Retirement Fund..	1894	....	3.7	3.9	3.8	3.9	4.0	4.1	3.8	4.1	4.2
4. Health Department Pension Fund.....	1894	1.6	1.5	2.3	2.3	2.6	2.7	2.8	3.3	3.9	5.9
5. College of the City of N. Y. Retirement Fund.....	1902	6.1	4.5	3.5	3.5	2.4	2.5	1.1	1.3	1.2	0.9
6. City of New York Employees' ("Grady") Retirement Fund	1906	....	....	....	....	....	....	0.02	0.06	0.07	0.2
7. Department of Street Clean- ing Relief and Pension Fund	1911	....	....	....	....	....	....	....	0.4	2.4	3.5
8. Supreme Court, First Depart- ment, Retirement Fund...	1911	....	....	....	....	....	....	0.1	0.6	1.4	1.8
9. Supreme Court, Second De- partment, Retirement Fund	1914	....	....	....	....	....	....	....	....	....	0.2
Total, All Funds.....	....	....	....	....	....	....	....	4.1	4.2	4.6	4.8

TABLE 63

POLICE PENSION FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls, 1905-1914

Year	Strength of Force ¹	Total Pensioners		Former Employees		Dependents ²		Payroll of Active Force ³	Pensions Paid	
		Number	Per Cent. of Active Force	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force		Amount ⁴	Per Cent. of Active Payroll
1905.....	8,860	2,672	30.16	1,467	16.56	1,205	13.60	\$11,423,000.16	\$1,296,779.87	11.35
1906.....	8,874	2,826	31.84	1,610	18.14	1,216	13.70	11,870,201.76	1,342,053.55	11.31
1907.....	9,462	2,962	31.30	1,768	18.68	1,194	12.62	12,366,862.85	1,497,232.37	12.11
1908.....	10,013	3,059	30.55	1,831	18.29	1,228	12.26	12,969,902.12	1,567,584.26	12.09
1909.....	10,183	3,217	31.59	1,965	19.30	1,252	12.29	13,416,634.40	1,633,420.53	12.17
1910.....	10,178	3,393	33.34	2,062	20.16	1,341	13.18	13,938,197.89	1,721,819.84	12.35
1911.....	10,208	3,711	36.35	2,296	22.49	1,415	13.86	14,189,107.25	1,850,698.12	13.04
1912.....	10,374	3,903	37.62	2,439	23.51	1,464	14.11	14,442,204.30	2,087,644.28	14.46
1913.....	10,844	4,201	38.74	2,721	25.09	1,490	13.65	14,702,159.48	2,313,130.88	15.73
1914.....	10,708	4,234	39.54	2,705	25.26	1,529	14.28	15,205,558.96	2,456,805.13	16.16

¹ As of December 31. ² One or more children of one family considered as a unit. ³ Aggregate amounts paid in salaries to members of the uniformed force. ⁴ Aggregate amounts paid to pensioners.

TABLE 64

FIRE DEPARTMENT RELIEF FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls,
1905 to 1914

Year	Strength of Force ¹	Total Pensioners ¹		Former Employees		Dependents ¹		Payroll of Active Force ²	Pensions Paid ⁴	
		No.	Per Cent. of Active Force	No.	Per Cent. of Active Force	No.	Per Cent. of Active Force		Amount	Per Cent. of Active Payroll
1905.....	3,565	1,027	28.81	530	14.87	497	13.94	\$4,924,842.19	\$581,547.47	11.81
1906.....	3,797	1,065	28.57	558	14.69	527	13.88	5,349,959.91	605,478.31	11.32
1907.....	4,118	1,164	28.26	597	14.49	567	13.77	5,730,377.91	649,031.09	11.33
1908.....	4,247	1,215	28.60	615	14.48	600	14.12	6,050,228.18	683,938.90	11.29
1909.....	4,352	1,291	29.66	667	15.33	624	14.34	6,287,506.06	728,822.40	11.59
1910.....	4,324	1,387	32.08	727	16.81	660	15.27	6,551,379.93	791,798.14	12.09
1911.....	4,422	1,477	33.40	792	17.91	685	15.49	6,745,219.90	879,975.59	13.05
1912.....	4,417	1,534	34.73	824	18.65	710	16.08	6,855,800.34	985,702.28 ⁵	14.38 ⁵
1913.....	4,956	1,636	33.01	890	17.96	746	15.05	7,115,802.04	985,727.67	13.85
1914.....	5,004	1,686	33.69	911	18.21	775	15.48	7,518,200.48	1,058,424.21	14.08

¹ As of December 31st.² One or more children of one family considered as a unit.³ Aggregate amounts paid in salaries to members of the uniformed force.⁴ Aggregate amounts paid to pensioners.⁵ Sudden increase is due to change in method of payment of pensions to widows and children. The total for 1912 includes approximately \$38,800.00 for such pensions for November and December, 1911. Amounts for 1913 and 1914 are pensions for calendar years.

TABLE 65

TEACHERS' RETIREMENT FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls—
1905 to 1914

Year	Strength of Force ¹	Pensioners		Payroll of Active Force ²	Pensions Paid	
		Number ¹	Per Cent. of Active Force		Amount	Per Cent. of Active Payroll
1905...	13,888	698	5.03	(³)	\$526,502.36	....
1906...	14,660	805	5.49	\$16,905,442.00	616,984.54	3.65
1907...	15,728	909	5.78	17,821,473.00	689,390.64	3.87
1908...	16,655	950	5.70	18,941,096.00	724,129.78	3.82
1909...	17,244	1,008	5.85	19,848,287.00	777,800.85	3.92
1910...	17,907	1,089	6.08	20,763,093.00	833,863.59	4.02
1911...	18,369	1,173	6.39	21,515,845.00	880,389.83	4.09
1912...	19,073	1,259	6.60	25,772,997.00	983,554.99	3.82 ⁴
1913...	19,681	1,515 ⁵	7.70	27,018,444.00	1,108,874.30	4.10
1914...	20,588 ²	1,549 ⁶	7.52	28,525,752.00	1,183,397.08	4.15

¹ As stated in the annual report of the Teachers' Retirement Fund for 1913, figures for July 31st of the years indicated.

² Number of participating employees June 30, 1914, as shown by census of municipal service.

³ Estimated on the basis of the 1% deductions from salaries during the calendar years indicated.

⁴ The decrease is explained by the extraordinary increase in the payroll for 1912, due to a general raise in salary scales.

⁵ As of December 31st.

⁶ Deductions from salaries were made only for part of this year.

TABLE 66

HEALTH DEPARTMENT PENSION FUND

Comparative Growth of Salary and Pension Rolls, 1905-1914

Year	Strength of Force ¹	Total Pensioners ¹		Members		Dependents		Payroll of Active Force	Pensions Paid	
		Number	Per Cent. of Active	Number	Per Cent. of Active	Number	Per Cent. of Active		Amount	Per Cent. of Active Payroll
1905.....	1,298 ²	27	2.08	21	1.62	6	.46	\$1,133,323.50 ⁴	\$18,115.06	1.60
1906.....	1,742 ²	29	1.66	22	1.26	7	.40	1,417,578.00 ⁴	21,205.24	1.50
1907.....	1,350 ²	35	2.59	26	1.93	9	.66	1,087,033.70 ⁴	26,271.78	2.33
1908.....	1,411	41	2.91	32	2.27	9	.64	1,287,910.00 ⁴	29,698.14	2.31
1909.....	1,422	49	3.45	39	2.74	10	.70	1,369,315.00 ⁴	35,804.76	2.62
1910.....	1,441	47	3.26	36	2.50	11	.76	1,442,490.00 ⁴	38,870.61	2.69
1911.....	1,337	53	3.96	42	3.14	11	.82	1,423,976.00 ⁴	40,160.81	2.82
1912.....	1,316	64	4.86	53	4.03	11	.83	1,400,261.00 ⁴	45,471.73	3.25
1913.....	1,326	76	5.73	64	4.83	12	.91	1,400,423.00 ⁴	54,030.74	3.86
1914.....	1,256	97	7.72	85	6.77	12	.96	1,330,568.00 ⁴	78,776.65	5.92

¹ As of December 31st.² In 1905 and 1906 no salary deductions were contributed to the fund, and all employees were eligible to its benefits.³ Since June, 1907, only such employees as contributed 1% of their salaries to the fund were eligible to its benefits.⁴ Taken from annual report of the Health Department.⁵ Payroll expenditures to May 31st include the entire department; from June 1st to December 31st they are based upon the 1% deductions from salaries, as shown in the cash book of the Health Department Pension Fund.⁶ Payroll expenditures for the year based upon 1% deductions from salaries, as shown in cash book of the Health Department Pension Fund.

TABLE 67
COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND
Comparative Growth of Salary and Pension Rolls, 1905-1914

Year	Strength of Force ¹	Pensioners		Payroll of Active Force	Pensions Paid	
		Number	Per Cent. of Active		Amount	Per Cent. of Active Payroll
1905...	168	4	2.38	\$270,000.00	\$16,330.45	6.05
1906...	178	4	2.24	302,000.00	13,540.18	4.48
1907...	207	4	1.93	334,121.35	11,687.39	3.50
1908...	219	3	1.37	361,411.71	12,812.37	3.54
1909...	237	4	1.69	390,857.93	9,466.54	2.42
1910...	244	4	1.64	421,438.49	10,449.84	2.48
1911...	235	3	1.28	437,991.99	4,741.25	1.08
1912...	220	3	1.36	443,839.42	5,736.36	1.29
1913...	216	4	1.85	464,998.21	5,671.71	1.22
1914...	223	4	1.79	483,963.56	4,325.00	.89

¹ As of December 31st.

TABLE 68
CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND
Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls
1906-1914

Year	Strength of Force	Pensioners ²		Payroll of Active Force	Pensions Paid	
		Number	Per Cent. of Active Force		Amount	Per Cent. of Active Payroll
1906...	1	....	.....	\$1,500.00	....
1907...	1	....	.....	1,500.00	....
1908...	2	....	.....	1,575.00	....
1909...	2	....	.....	2,225.44	....
1910...	4	....	.....	3,208.36	....
1911...	11	....	\$44,876,990.18 ³	8,253.64	.02
1912...	28	....	44,336,911.79	25,419.95	.06
1913...	63	....	45,335,695.16	30,957.13	.07
1914...	32,856 ¹	166	.51	46,225,613.99	96,663.26	.21

¹ As of June 30, 1914.

² As of December 31, 1914.

³ Includes Department of Street Cleaning, as no employee covered by the provisions of that fund was pensioned in 1911.

TABLE 69

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls, 1911 to 1914

Year	Strength of Force ¹	Total Pensioners ¹		Former Employees		Dependents ²		Payroll of of Active Force ³		Pensions Paid ⁴	
		Number	Per Cent. of Active Force	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force			Amount	Per Cent. Active Payroll
1911.....	.....	.....	.....	.....	.....	10 ⁵	.....	.....	.....	\$299.77	.....
1912.....	5,292	96	1.81	75	1.42	21	.39	\$4,086,257.62	.....	15,582.21	.38
1913.....	5,464	356	6.51	281	5.14	75	1.37	4,666,556.19	.....	114,096.38	2.44
1914.....	5,474	484	8.84	347	6.34	137	2.50	4,667,298.06	.....	163,053.71	3.49

¹ As of December 31st.² One or more children of one family considered as a unit.³ Aggregate amounts paid in salaries to members participating in the fund.⁴ Aggregate amounts paid to pensioners. In accordance with law, no actual payments were made until January, 1913.⁵ Nine widows and one widowed mother were pensioned to take effect between September 10th and December 31st, 1911.

TABLE 70

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls,
1911-1914

Year	Strength of Force ¹	Pensioners ¹		Payroll of Active Force	Pensions Paid	
		Number	Per Cent. of Active Force		Amount	Per Cent. of Active Payroll
1911...	263	1	.38	\$595,143.54	\$499.98	.08
1912...	289	5	1.73	659,175.22	4,053.03	.61
1913...	233	8	3.43	496,856.30	6,692.44	1.35
1914...	295	11	3.73	608,656.00	10,822.80	1.78

¹ As of December 31st.

TABLE 71

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Comparison of Active Force and Pensioner and of Salary and Pension Rolls, 1914

Year	Strength of Force ¹	Pensioners ¹		Payroll of Active Force	Pensions Paid	
		Number	Per Cent. of Active Force		Amount	Per Cent. of Active Payroll
1914...	177	1	.56	\$399,448.91 ²	\$900.00	.23

¹ As of December 31st.² Amount includes appropriation for fiscal year ending September 30, 1914, for 33 employees whose salaries are paid partly by the city.



Bund

~~See 1655, 13~~

**REPORT ON
THE PENSION FUNDS
OF THE
CITY OF NEW YORK**

PART II

**AN ACTUARIAL INVESTIGATION
OF THE
MORTALITY AND SERVICE EXPERIENCE
OF THE
SPECIAL AND GENERAL SERVICE FUNDS
FOR
MUNICIPAL EMPLOYEES**

COMMISSION ON PENSIONS

City of New York

1916

7. Yam (city) - Commission on relations.

**REPORT ON
THE PENSION FUNDS
OF THE
CITY OF NEW YORK**

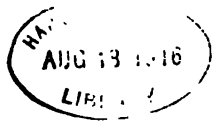
PART II

**AN ACTUARIAL INVESTIGATION
OF THE
MORTALITY AND SERVICE EXPERIENCE
OF THE
SPECIAL AND GENERAL SERVICE FUNDS
FOR
MUNICIPAL EMPLOYEES**

**INCLUDING
Tables and Diagrams on Family History and a
Valuation of Assets and Liabilities**

**COMMISSION ON PENSIONS
City of New York
1916**

Soc 1655.83



gratis



NEW YORK, May 15, 1916.

*To the Commission on Pensions,
City of New York.*

SIRS:

The following report contains the fundamental facts which are indispensable to the intelligent consideration of the city's existing pension plans, and upon which alone a sound, properly organized new pension system can be constructed. It represents the results of a complete actuarial investigation of the nine existing pension systems of the city of New York, and furnishes the first comprehensive data ever available with reference to these funds.

In previous reports it has been made clear that the present pension plans, which have involved already a disbursement of nearly \$57,000,000, and which now entail an expenditure of over \$5,000,000 a year, were put into operation wholly without forecast or intelligent thought of the future cost which the commitments assumed would involve.

When the Pension Commission was requested by Mayor Gaynor, and subsequently by Mayor Mitchel, to study and present plans for the reorganization of the funds, it found it impossible to consider its problem intelligently because of the total lack of facts. It was necessary to obtain the facts, and as a first step in this effort, to devise a method for ascertaining what the prospective cost of existing plans would be. This cost can be obtained only through an actuarial analysis of the essential elements of the pension problem. These are fully discussed in the report which broadly covers the service and mortality experience of the employees to whom the pension funds relate, the amounts of such pensions, and the average life and resulting total disbursement to prospective pensioners.

Since experience is the only basis on which a sound fund can be constructed, it was necessary to analyze the experience of the city of New York for a sufficient period to lay the foundation for sound conclusions. A six-year period was selected extending from 1908 to 1914 inclusive. Every employee on the rolls of the city of New York at that time was taken into consideration for each of the years in question. The salaries, number of employees, length of service, withdrawals through death, resignation or removal, the age of employees, provisions underlying the different pension plans with respect to maturity of pension rights, and the amount of pension, all were taken into consideration.

The statistical analysis has required more than two years' work, and is unparalleled in its scope by any similar study of a body of employees ever made anywhere in the world. In formulating the plan of investigation, the experience of insurance companies in dealing with actuarial problems was drawn upon, and the advice of the Actuarial Society of America obtained. This Society appointed a consulting board of actuaries consisting

of Messrs. William A. Hutcheson, Robert Henderson and Henry Moir, Actuaries of the Mutual Life Insurance Company, the Equitable Life Assurance Society and the Home Life Insurance Company respectively, who have aided the Commission most generously by expert advice and counsel. The experience of European countries, notably England, where pension systems have been long in operation and are now rapidly undergoing reorganization on the basis of similar investigations, was heavily drawn upon for guidance in the studies made by the Commission. The work was put in the direct charge of Mr. George B. Buck, an actuary with special training in pension problems, and a special staff was recruited for the detail statistical and mathematical analysis. This staff was from time to time supplemented by assistance loaned by the Commissioner of Accounts and by the advisory assistance of the Bureau of Census of the Department of Education.

It is not necessary to summarize the results of this study which are fully set forth in the report in easily intelligible form, except to say that the computations show that the present liability of the existing pension funds, on the basis of existing laws and the past experience, for present and prospective pensioners aggregates the stupendous total of \$215,520,413. Against this charge there are funds in hand aggregating \$3,849,653 and prospective receipts from the contributions of employees where such contributions are required, of \$8,895,192, leaving a deficit of \$202,775,568 to be met by the city by way of indirect contribution and out of appropriations from tax levy funds.

As shown in Part I of the final report of the Commission, which has been previously published, there are many considerations which make it undesirable for the city to continue the present pension plans by reason of their inequity and failure to make suitable provision for the retirement of employees under proper conditions, and their lack of conformance with standards of efficient management. If this were not so, the financial burden which they will enforce on the city demands a revision of existing pension systems on a basis which would in part relieve taxpayers of excessive charges, and what is perhaps more important, would provide for the accumulation of reserves now wholly lacking against the increased annual charges for pension purposes. The city, in its pension systems, has blindly, perhaps unwittingly, embarked upon a vast financial program with no thought of the cost involved or the methods of financing this cost.

In its subsequent recommendations the Pension Commission will deal concretely with pensions for each class of employees and methods for financing them. It recognizes that radical changes, with reference to existing employees, may not be feasible in those funds which are now established by law. It will, however, submit proposals for radical reorganization with respect at least to future entrants into the service. Such proposals will be carefully considered, before submission, in the light of the finances of the city, the general employment problems of the city and the rights and viewpoint of the employees themselves.

In submitting this report the Commission desires to express its appreciation of the efficient work of its actuarial staff, and acknowledges with thanks the very helpful co-operation afforded it by other branches of the government in the performance of its work. It is especially grateful to the

Actuarial Society of America and to the special advisory board of actuaries for their generous and continuous assistance, all of which has been rendered voluntarily and without cost to the city.

Respectfully submitted,

HENRY BRUÈRE,
Vice-Chairman and Secretary.

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The preparation of this report has necessarily involved an enormous amount of actuarial and statistical work. The undertaking has extended over a period of nearly two years, in which time many problems have been encountered which required in their solution the exercise of discretion and forethought. In these matters the author has had the counsel of William A. Hutcheson, Actuary of the Mutual Life Insurance Company, Robert Henderson, Actuary of the Equitable Life Assurance Society, and Henry Moir, Actuary of the Home Life Insurance Company, who constitute the Advisory Committee of the Actuarial Society of America. These gentlemen have been most generous in giving valuable time to the consideration and approval of the general methods used in the work, and to them the author wishes to express his gratitude.

Acknowledgment is due to John S. Thompson, Actuary, for suggestions and criticisms, and Lewis Meriam, Statistician, for editorial criticisms and suggestions on the report as a whole and for special assistance in the preparation of the introduction. To them and to Margaret A. Burt and other members of the Commission's staff the author desires to express appreciation.

GEORGE B. BUCK.

New York, May 8, 1916.

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INTRODUCTION

Three principal objects have been sought in the actuarial investigation of the pension funds of the City of New York: (1) to determine the exact financial condition of each fund as it was on the date of the examination; (2) to determine the minimum rates of contribution which a new fund just starting would have to collect, either from the city or the employee or from the two combined, in behalf of each new entrant in order to maintain the fund in a constant state of solvency, and (3) to provide a basis for calculating the financial effect on the fund of any increases or decreases in the extent of the pension provisions now in force, or of any new provisions which may be introduced in the event of reorganization.

Forecasting the future—Determining the financial condition of a pension fund is by no means the same problem as determining the immediate financial condition of an individual. The solvency of an individual can commonly be demonstrated by showing that what he has exceeds what he owes at the moment. The calculations relate almost entirely, if not entirely, to the present. In determining the financial condition of a pension system, the calculations relate very largely to the future, and in certain instances to the somewhat distant future. The moment an employee enters the city service the pension system becomes liable to pay him certain pension benefits provided certain things happen to him and provided he himself fulfills certain conditions. The amount of the liability thus incurred depends on the probability that these contingencies will happen and the probability that the employee will fulfill the conditions. Similarly the pension system has certain sources of revenue, such as contributions by the city, contributions by the employee, and, what is very important, interest earned by accumulated funds. The assets which are to be available to pay the pensions now being earned when they fall due after several years' service will depend in part on the revenue to be secured from these sources in the future. The financial condition of a pension fund can therefore be determined only by forecasting the future.

The actuary, in forecasting the future, does not depend on any peculiar or occult powers, but relies on three distinct processes. First, by analyzing the legal provisions of the pension fund and the practice under those provisions, he determines what the factors or forces are that affect the financial condition of the fund. Second, through a thorough and painstaking census of all the employees and pensioners, and through a careful examination of many city records, he collects a great body of data, which, when properly tabulated, reveal exactly how these forces have operated in the past. Third, on the assumption that these factors or forces will continue to operate in the future essentially as they have in the past he prepares rates of operation for the future based on the rates for the past.

Important forces determining pension costs—Five of the factors or forces which have to be considered in valuing the fund, as the process

is technically called, are of special importance. First, perhaps, is the rate of mortality among employees in the active service, which is needed to forecast how many of those now on the rolls will die before reaching the pension age or fulfilling the pension conditions. Second, is the rate of withdrawal, to show how many of those in the active service will leave it by voluntary resignation or by dismissal without drawing a pension. Third, is the rate of retirement on pension, to show how fast and at what ages and service periods the employees will avail themselves of the pension privilege. Where pensions are paid for disability as well as for length of service this rate is divided to distinguish between those who leave the service because they are disabled and those who leave because they have fulfilled the service requirements and prefer to retire. Fourth, is the rate of mortality among pensioners, required so that the actuary may estimate the amounts which will be paid before the pension lapses on the death of the pensioner. This rate has to be divided to distinguish between disability pensioners and service pensioners, because it cannot be assumed that persons who have had to retire on account of sickness or service accidents will live as long as those who retire merely because they have fulfilled the conditions and desire to retire. Fifth, when the benefit bears a fixed relationship to salary, a salary scale of employees is prepared to show the probable future movement of salaries as anticipated from the experience of the past. Sometimes funds contain provisions for benefits to widows and children, as in the New York City police and fire funds, and then other and more elaborate compilations have to be made; and always the rate of interest must be considered.

Interest—The rate of interest is, of course, of great importance in forecasting the future of a financial system providing for regular contributions to meet obligations to mature in the future, because the money received earns interest until it is paid out. The effect of interest is occasionally underestimated or lost sight of in offhand discussions of the pension problem. A dollar invested at four per cent. has earned practically another dollar by the end of seventeen years, and hence, roughly speaking, a dollar paid to the pension fund to-day will, at four per cent., pay for two dollars' worth of benefits at the end of about seventeen years, and for four dollars' worth at the end of thirty-five years. Similarly a dollar paid as a pension contribution in the first year of an employee's service is worth twice as much as a dollar paid in the eighteenth year of service and four times as much as a dollar paid in the thirty-sixth year. In valuing a fund, therefore, the actuary must make full allowance for the earning power of the money which will remain in the fund for any time between its receipt as a contribution and its payment as a benefit.

The present value—To make proper allowance for the difference between a dollar in hand and a dollar to be received in the future, and the difference between a dollar due to be paid to-day and a dollar due to be paid in the future, the actuary has to determine what a dollar to be received into the fund at a certain time in the future would be worth if in hand to-day and similarly what amount if in hand to-day would, with the interest it would gain, pay a debt of a dollar due at a certain time in the future. In

technical language he calculates the present value of all future assests and the present value of all future liabilities.

The actuarial balance sheet—The present report discusses in detail the precise methods followed in making the actuarial valuations of the numerous pension funds of New York City; methods which have, of course, been outlined only in a very general way in the preceding paragraphs. The result of these actuarial valuations is the actuarial balance sheet. For each of the separate funds a balance sheet is given in the section of the report dealing with that fund, and finally for all funds combined a single balance sheet is given. This combined balance sheet is reproduced on pages 4 and 5.

The pension deficit—This combined balance sheet shows that the present value of the benefits to be paid those who are already on pension is \$48,119,976; and the present value of benefits to prospective pensioners among those now in the active service and the dependents of employees now in service is \$167,400,437. The grand total present liability for the benefits under the system is \$215,520,413. Against this liability can be set \$3,849,653 of funds in hand, and \$8,895,192, the present value of the future contributions of present employees. The deficit, in other words, the amount by which the present value of the obligations exceed the present value of all resources is \$202,775,568.

The contribution rates—The second part of the actuary's work which is of prime importance is the development of the rates of contribution which a new fund, just starting but paying the same benefits as the plan now in operation, would have to charge on account of new entrants, if the fund is to be maintained in a constant state of solvency. These rates can be likened in some ways to the premium rates of insurance companies but it must be remembered that the rates here given include no contributions toward the expenses of administering the work and no profits. They are minimum cost figures. They are annual premiums expressed as percentages of salary; or, in other words, they show the number of cents which would have to be charged each year per dollar of salary paid to an entrant of the specified class, to provide the pension promised under the law. No matter who pays the premium, the employer, the employee, or the two combined, these rates of contribution or rates of cost remain the same.

The determining forces—A great complexity of interacting forces, and not any single force, determine what this rate of contribution must be in a given instance. Among these forces are the ones previously mentioned as those which the actuary has to forecast for the future on the basis of the experience of the past, such as the rate of mortality in the active service and among pensioners, the rate of withdrawal by resignation or dismissal, the rate of retirement as disability and service pensions and the probability of salary increases. The rate of interest is of course of great importance. Certain other forces are largely determined by the law itself and others by the sex, age and occupation of the employee.

A VALUATION OF ASSETS AND LIABILITIES

Valued as of

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to Employees now on the Pension Rolls of the funds:	
Police Pension Fund	\$18,785,176
Fire Department Relief Fund	7,245,897
Teachers' Retirement Fund—Men	722,460
Teachers' Retirement Fund—Women	10,858,750
Health Department Pension Fund—Men	872,430
Health Department Pension Fund—Women	21,428
College of the City of New York Retirement Fund	24,152
City of New York Employees' Retirement Fund—Clerks	299,593
City of New York Employees' Retirement Fund—Mechanics	143,008
City of New York Employees' Retirement Fund—Laborers	114,805
Department of Street Cleaning Relief and Pension Fund	716,696
Supreme Court, First Department, Retirement Fund	58,720
Supreme Court, Second Department, Retirement Fund	4,357
Pensions to Dependents now on the Pension Roll:	
Police Pension Fund	5,021,433
Fire Department Relief Fund	2,903,009
Health Department Pension Fund—Men	2,036
Health Department Pension Fund—Women	40,984
Department of Street Cleaning Relief and Pension Fund	285,042
Total Pensions Entered Upon	\$48,119,976
Pensions to Employees now in Active Service:	
Police Pension Fund	\$40,206,284
Fire Department Relief Fund	24,928,118
Teachers' Retirement Fund—Men	7,322,100
Teachers' Retirement Fund—Women	50,906,450
Health Department Pension Fund—Men	1,521,199
Health Department Pension Fund—Women	403,681
College of the City of New York Retirement Fund	480,067
City of New York Employees' Retirement Fund—Clerks	6,028,545
City of New York Employees' Retirement Fund—Mechanics	3,093,457
City of New York Employees' Retirement Fund—Laborers	1,683,344
Department of Street Cleaning Relief and Pension Fund	4,197,675
Supreme Court, First Department, Retirement Fund	879,143
Supreme Court, Second Department, Retirement Fund	259,275
Pensions to Dependents of Employees now in Active Service and of Pensioners now on Pension Roll:	
Police Pension Fund	14,253,522
Fire Department Relief Fund	6,496,898
Health Department Pension Fund—Men	28,167
Health Department Pension Fund—Women	1,755
Department of Street Cleaning Relief and Pension Fund	3,810,757
Total Pensions Not Entered Upon	\$167,400,437
Grand Total	\$215,520,413

OF THE COMBINED PENSION FUNDS

June 30, 1914

ASSETS	
Item	Present Value of Payments to be Received
Funds in Hand:	
Police Pension Fund.....	\$936,650
Fire Department Relief Fund.....	850,446
Teachers' Retirement Fund—Men.....	174,590
Teachers' Retirement Fund—Women.....	708,125
Health Department Pension Fund—Men.....	248,819
Health Department Pension Fund—Women.....	81,228
College of the City of New York Retirement Fund.....	5,054
City of New York Employees' Retirement Fund—Clerks.....	.....
City of New York Employees' Retirement Fund—Mechanics.....	.....
City of New York Employees' Retirement Fund—Laborers.....	.....
Department of Street Cleaning Relief and Pension Fund.....	838,767
Supreme Court, First Department, Retirement Fund.....	5,974
Supreme Court, Second Department, Retirement Fund.....	.....
Total Funds in Hand.....	\$3,849,653
Contributions by Employees:	
Police Pension Fund.....	\$3,206,594
Teachers' Retirement Fund—Men.....	1,000,125
Teachers' Retirement Fund—Women.....	3,183,600
Health Department Pension Fund—Men.....	86,222
Health Department Pension Fund—Women.....	28,942
Department of Street Cleaning Relief and Pension Fund.....	1,316,533
Supreme Court, First Department, Retirement Fund.....	73,176
Total Contributions by Employees.....	\$8,895,192
Deficiency:	
Police Pension Fund.....	\$74,123,171
Fire Department Relief Fund.....	40,723,476
Teachers' Retirement Fund—Men.....	6,044,335
Teachers' Retirement Fund—Women.....	57,798,985
Health Department Pension Fund—Men.....	1,834,852
Health Department Pension Fund—Women.....	611,617
College of the City of New York Retirement Fund.....	499,165
City of New York Employees' Retirement Fund—Clerks.....	7,228,138
City of New York Employees' Retirement Fund—Mechanics.....	3,236,465
City of New York Employees' Retirement Fund—Laborers.....	1,798,149
Department of Street Cleaning Relief and Pension Fund.....	6,854,870
Supreme Court, First Department, Retirement Fund.....	858,713
Supreme Court, Second Department, Retirement Fund.....	263,632
Total Deficiency.....	\$202,775,568
Grand Total.....	\$215,520,413

Among the forces governed largely by the provisions of the pension law itself are the character of the benefits allowed under the system, the conditions upon which they are granted, their amount, and the administrative provisions introduced to protect the system from abuse. Obviously a system that provides a benefit only in the event of old age will, other things being equal, cost far less than one providing not only a superannuation benefit, but also a benefit on disability and a return of contributions in event of resignation or dismissal. Similarly one which does not permit retirement until an advanced age after a considerable period of service will cost far less than one allowing the same benefit but not requiring that the employee should have reached so high an age or shall have served so long a minimum period. The larger the amount of benefits under a given system the larger is the cost. When disability benefits are granted, the administration becomes highly important, because lax administration means that many who are not really disabled will get on the disability pensioners' roll and draw pensions for a long period. Differences between different funds in respect to these forces will cause great differences in pension costs or contribution rates.

Effect of sex—The sex of the employee is an important factor, giving rise as it does to various physiological, psychological, and economic differences. Exactly why women live longer than men is not fully known but that they do is apparent from the mortality rates, and necessitates that for equal benefits women be charged more than men, because they will live longer to enjoy them and on the average will receive more payments. Psychological and economic differences lead to a difference in the retirement rates, and these differences necessitate a variation in the premium. Whenever the fund to be valued has a large body of women employees and a large body of men, the actuary finds it necessary to distinguish the two sexes throughout.

Effect of age—That the age of the entrant is an essential factor is of course apparent. The young entrant will make many payments into the fund or will cause them to be paid in his behalf. They will draw interest over a long period of years. The old entrant will make few payments and the interest his payments will earn will be comparatively small. Other differences between the young entrant and the older entrant exist, affecting the probability of their living to the pension age. In any equitable scheme requiring employees to contribute and in any scientific scheme financed wholly by the employer, differences in the cost for different ages have to be recognized.

Many rates required—Separate rates then must be worked for each fund and where many men and women are employed the rates for the two sexes must be prepared separately and a similar course must be followed where the fund is composed of large distinct groups. For each fund or division of a fund a separate rate has to be prepared for each probable entrance age. Such rates for each fund or a division of a fund are presented in the sections of the report dealing with it and are discussed in detail. For the purposes of comparison of the cost of the benefits under the

different funds and divisions of the fund a table has been prepared showing for each fund the cost of each benefit granted under it for a person entering it at what is the average age of entrance as shown by the past experience. This table may be regarded as showing the average cost of each benefit under each fund. The table is reproduced below.

**RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES
OF SALARIES FOR THE AVERAGE AGE AT ENTRANCE
INTO EACH FUND**

All Funds

FUND OR CLASS	Total All Pensions	PENSION TO EMPLOYEES		Pension to Widows	Pension to Children	Pension to De- pendent Parents
		Service Pensions	Disability Pensions			
Fire Department Relief Fund..	19.73	11.17	3.47	4.62	.25	.22
Police Pension Fund.....	14.99	2.18	9.02	3.62	.14	.03
Department of Street Cleaning Relief and Pension Fund.....	8.55	.61	3.41	4.12	.15	.26
Health Department Pension Fund—Men.....	7.36	5.81	.87	.58	.04	.06
Teachers' Retirement Fund— Women.....	7.17	5.95	1.22	...	...	...
Health Department Pension Fund—Women.....	6.89	5.92	.91	...	...	.06
Supreme Court First Depart- ment, Retirement Fund.....	4.64	4.42	.22	...	...	...
Teachers' Retirement Fund— Men.....	4.13	3.69	.44	...	...	...
Supreme Court, Second Depart- ment, Retirement Fund.....	3.46	3.46	...	...	...	...
College of the City of New York Retirement Fund.....	3.40	3.40	...	...	...	...
City of New York Employees' Retirement Fund—Mechanics	1.43	1.43	...	...	...	...
City of New York Employees' Retirement Fund—Clerks....	1.16	1.16	...	...	...	...
City of New York Employees' Retirement Fund—Laborers..	.80	.80	...	...	...	...
Average Fund.....	7.14	3.57	2.30	1.18	.05	.04

Cost of benefits—The cost of all benefits under the retirement system varies from an annual premium of 19.73 cents in each dollar of salary in the case of members of the Fire Department Relief Fund to one of 0.80 cents in the case of the laborers in the City of New York Employees' Retirement Fund. The laborers, it will be noted, receive only a service pension and this, by the way, is awarded only in case the employee is also disabled, whereas the firemen receive a service pension costing 11.17 cents in the dollar of salary; a disability pension costing 3.47 cents, a pension to widows costing 4.62 cents, one to children costing 0.25 cents, and one to dependent parents costing 0.22 cents. Next to the firemen in total cost of all benefits come the members of the Police Pension Fund, with a pension that costs 14.99, and providing for all classes of benefits. The other funds, it will be noted, are arranged in the tables in the descending order according to the total cost of the benefits provided.

That gross inequalities exist in the value of the pension benefits as be-

tween different branches of the city service is indicated by the differences in the contribution rates. Such inequalities are not surprising when it is remembered that each system now in existence was developed independently, on a sort of hit and miss plan, with little or no regard to what had been done, or what was to be done, for other classes of city employees. That peculiar conditions of service demand special pension benefits is of course generally recognized, but that men engaged in similar types of work should receive different benefits merely because they happen to be attached to different branches of the service emphasizes the need of reorganization.

Reorganization imperative—Reorganization will have to come, whether it attempts to remedy such inequalities or not, for the actuarial balance sheets for the separate funds all show liabilities greatly in excess of assets. The time is rapidly approaching when the funds will no longer be able to pay the pension claims as they come due. The teachers' fund reached this stage while the present report was in preparation. Now it is not able to pay the teachers who have already retired, and for over a year it has not been able to retire any additional teachers no matter how great the need. The Health Department Fund will soon be in exactly the same condition. Reorganization there, too, is imperative.

Data for scientific reorganization—The greatest value of the present investigation is that it furnishes, for the first time, the data needed to reorganize these funds on a sound basis. By the expenditure of an immense amount of labor, the forces which determine pension costs in the different branches of the service have been measured and the measurements are applicable to the service for a good many years to come. The pension provisions may be continued as they are with new sources of income, or they may be changed; the employees may contribute to the funds in large amounts or they may not contribute at all; benefits may be increased or decreased; pensions may be based on salary or they may be flat sums independent of salary; but whatever the plans proposed the rates of action of the fundamental forces that determine the cost are now known and are contained in the basic tables of the present report. These tables are to the pension fund what the standard mortality tables are to insurance companies. Their use is not limited to a single plan, for they contain the data essential to determine the cost of any plan.

Cost a determining factor—Many specific pension schemes and pension provisions will undoubtedly be suggested by representatives of the employees and of the city government in the effort to reach an agreement as to what is the best system for a particular service or for a particular group of employees. A determining factor in this consideration will be that of cost; that is, whether the employees and the city can afford a benefit which in other ways seems highly desirable. Just as the basic tables of the report furnished the means of determining mathematically the rates of contribution which would be required from the city or the employee or the two combined to maintain the present fund in a solvent condition, so they furnish the means of determining the rates for any other system. If the rates are found sufficiently low to make the scheme come within the range of possi-

bility then an actuarial balance sheet for the proposed systems can be prepared to show the extent of the liability which will be incurred under it for those already in the service. In this way the present report will probably develop its greatest usefulness.

The sections of the report—The report is divided into four sections or parts. The first deals with the general methods employed in collecting the basic data and arranging it in the form required for the valuation; the second, with the nine separate pension funds considered and such special methods as were used for them; the third, with the basic data and the methods followed in valuing pension funds to widows and children. The fourth section brings together all the statistics necessary for the proper consideration of the pension systems of the City of New York as a single unit so arranged as to facilitate comparison between the different funds.

SECTION I

GENERAL DESCRIPTION OF DATA AND METHODS USED

DATA USED AS BASIS FOR VALUATIONS

The mortality and service experience of the city employee during the period from June 30, 1908, until June 30, 1914, was used as the basic data for the present valuation. The required information regarding this experience was secured in part directly from the employees and in part from the records of the various departments. In few cases were the records arranged in a way that in the least facilitated the work of the Commission and rarely did they contain the information necessary for a scientific administration of a pension fund. However, through various combinations of the records of the departments, the records of the Civil Service Commission, the files of the City Record, the vital statistics registration in the Board of Health, and the payrolls on file in the Hall of Records, the Commission was able to accomplish what had at first seemed an almost impossible task.

COMMISSION ON PENSIONS

I hereby certify that the answers to the following questions are true and correct to the best of my knowledge and belief.

Name to fill:
Family name
Given name or name

State of birth

Business, office or branch

Department or independent institution

Service

NO 129998

ACTIVE SERVICE CARD

NOTICE

Please consider great care in answering the inquiries on this schedule. If in doubt as to proper answer to city questions, consult the immediate superior officer or person designated by the head of the department to answer such inquiries. The purpose of these questions is to secure for the benefit of the Commission on Pensions the most complete and correct data possible for the city employees. Incorrect or careless statements will seriously affect the accuracy of the entire result. In the interest of a correct answer, please read carefully the instructions in each of the items to be answered, as possible. Your answers will be used collectively and no individual records will be published.

NO 129998

Department

Business, office or branch

Section or Division

1. Mark below with a cross (x) the position held from which you may be pensioned now or at a later time

Police Department

Fire Department

Street Cleaning Department

Health Department

College of the City of New York

Normal College

School Teachers

Judges Court

County Law, or not covered by pension

2. Active Employees (under no entry)

3. State title of your position as it appeared on the pay roll June 30, 1914

4. Give the date you were born

5. Give date of beginning your present service in the department

6. Give date of wife's death

7. Give date of wife's death, if dead, and employee has remained unmarried

8. Give name and age of each of your children. If you have no children write in words "No Children." List according to age, eldest first.

9. What was your rate of compensation in June 14

10. What is the amount of your present annual pension

11. From what pension fund

12. Check by a cross (x) married condition

13. Check sex (x) Male Female

14. If you are a veteran, check (x) Civil War Spanish War Regular Army or Navy Service

15. State your entire service in order of time in this or other departments or branches of the city or county governments or in the marine. Give present service last.

16. Give total service below under (a) and (b) as follows

17. Give to beginning of present service

18. Give to date of death

19. State referred by

20. Official Address

21. Telephone Number

COLLECTION OF SCHEDULES

The required information regarding persons in the active service on June 30, 1914, was secured directly from the employees themselves, by means of schedules which called for such data as would be sufficient to value the benefits under any provision of the pension laws in force on that date. In distributing these cards to the employees and in collecting them after they had been filled out, the Commission was assisted in each department by representatives appointed to co-operate in the undertaking by the respective offices and bureaus. All schedules, after being prepared by the employees, were reviewed by the employee's superior officer before being forwarded to the office of the Commission. On page 13 is a copy of the schedule employed.

Schedules of distinctive colors, calling for slightly different information, were prepared (1) for employees who had left the active service without pension during the six-year period; (2) for pensioners on the rolls on June 30, 1914, and (3) for those whose pensions had terminated in the preceding six years. These schedules were prepared by employees of the Commission on Pensions from the records in the departments.

Although data for the period from June 30, 1908, to June 30, 1914, were to be used as a basis for the tables showing the mortality and service experience of the force, records were secured for the period from December 31, 1907, to the date of the actual collection of the facts. By thus having the period for which the employees supplied data overlap, at either end, the period for which information was absolutely essential, the necessity for absolute precision as to the limiting dates on the part of the employees and field workers was eliminated. Data regarding facts not relating to the basic period were easily rejected in the office by mechanical methods and a precision as to time limits secured that would scarcely have been feasible had dependence been placed solely upon the many employees and the field workers who naturally could not be conversant with all the requirements of the census.

CHECKING OF SCHEDULES AS TO NUMBER AND COMPLETENESS

To make sure that schedules had been secured for all employees each department was requested to furnish the Commission with a statement showing the number of employees on the payroll in the various bureaus and divisions of the department as of June 30, 1914. The schedules received by the Commission were checked as to this number to make sure that no schedules for active employees were omitted. After the cards for the active service were thus checked the out of service cards were added and later, by means of tabulating machines, the cards were assorted so as to show the active service as of December 31, 1907, and as of June 30, 1914. The tables prepared from these assortments were again checked against the records of the department. This check was for the purpose of insuring that no cards for persons out of service had been omitted. The same methods were employed in checking cards for pensioners.

In the active service schedule shown on page 13 will be noted a

small coupon which contains the name of the employee and certain other facts. Similar coupons were attached to the schedules for the out of service employees and the pensioners. After the schedules for all departments in the city government had been received, these coupons were detached and arranged alphabetically. By this method all duplicate schedules were located and the cases of employees who had passed from one department of the service to another during the six-year period of the experience were discovered. Duplicates were of course removed, and where an employee had served in more than one department the records were adjusted, so that reports for such persons would tabulate consistently with those for persons who had been employed in but one service. Some idea of the volume of work incidental to this alphabetical assortment may be conveyed by the fact that 24,825 schedules were found, in which similarity of names were involved and these of course had to be examined for possible duplicates.

METHOD OF CORRECTING DEFECTIVE SCHEDULES

While little difficulty was experienced in obtaining the cards for persons in active service, it was sometimes impossible to obtain all the necessary data regarding persons who had left the service. In several departments all the information required regarding out of service employees was available with the exception of the employee's date of birth. In such case the cards were brought to the office of the Commission, assorted alphabetically and then taken to the Civil Service Commission where the employee's date of birth was generally secured from the records regarding his appointment. In a few cases, especially where the employee had been in the service for a very long period of time, the Civil Service Commission did not have a record of the date of birth. This difficulty arose frequently in the cases of persons who had died. In such instances the records were taken to the Health Department where search was made in the records to see if the employee had been born, had married or had died in New York City. If so the date of birth was secured from this source.

By these general methods the major portion of the desired information was secured. In fact 93% of all the cards were complete. The remaining 7% lacked generally the answer to but a single inquiry; in few cases were two or more inquiries unanswered, in fact in so few that such cases are practically negligible.

To permit the use of the small number of incomplete schedules in combination with the complete, the missing information was supplied by the Commission on the assumption that the distribution of the incomplete schedules according to the unknown facts would be the same as the corresponding distribution of the complete schedules. A method was devised whereby the incomplete cards for one department were corrected from the complete reports relating to that department only, and both the active service and the out of service cards for the department were used as a basis for the correction. The method was tested by selecting at random perfect cards containing complete data secured exclusively from the records, tabulating the information given on them, and then comparing the resulting

figures with those used as a basis for correcting the incomplete cards. The two sets of figures were so nearly identical that it is believed no appreciable error has been introduced into the work by the failure to secure complete data regarding a few individuals. The method made possible the use of such information regarding these people as was actually secured from the records and, what is far more important, has permitted the use of many complete schedules which could not have been used as the basis for experience tables had the few incomplete reports which related almost exclusively to out of service persons been excluded. Schedules for active employees in any department or division could not be included in the basis for the experience tables unless all the corresponding schedules for out of service employees for the same department or division could be made.

PREPARATION OF PUNCH CARDS FOR MECHANICAL TABULATION

For purposes of the tabulation the data on the schedules were transferred to punch cards by means of a system of code numbers. On pages 17 and 18 are copies of the cards used.

After the data were transferred to the punch cards, the cards were verified by reading the information punched into them back to the original schedule. In the latter part of the investigation this verification was performed by the use of a mechanical checker, devised by the Commission and built by the Hollerith Tabulating Machine Company.

MECHANICAL TABULATIONS MADE

After the cards were punched and verified they were tabulated mechanically by means of Hollerith tabulating machines. The code numbers employed in punching were arranged so that each card in any group to be tabulated had at least one hole that was common to all the other cards in that group and thus it was possible to check the sorting of the cards by groups practically instantaneously, and of course so far as possible each group was kept by itself in passing the cards through the machines. When combinations were required in the tabulation, work sheets were employed which showed in detail the figures for each of the groups that had to be combined to give the required results. In addition to facilitating tabulation these sheets served a further useful purpose in providing a check on the totals used, for it was possible to determine that the experience of each of the component groups of a combination was in harmony with the experience of the combination as a whole, thereby preventing the inclusion of a group with others which had a distinctly different experience.

N. Y. C. PENSION COMMISSION. GENERAL DATA															Annual or Per Mm	
Fund	Number	Class	Work	Birth	Legal Age	Married	Pensioned	Pension	Year	Birth	Children	SALARY			Pension or Prior Service	Clerk
												1910	1911	1913	1914	
RR	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X	0
XX	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X	0
Dept	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

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R R			Number		Class		Age at Death		Date of Birth		Wife's Birth		Total Age		NUMBER OF CHILDREN NUMBER AND AGES LAST BIRTHDAY																					Age of Mother at Birth		Age of Wife at Death																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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TABULATION OF MORTALITY AND SERVICE ACTUAL EXPERIENCE TABLES

The active service

A tabulation showing the experience of the active service during the last six years was necessary to measure the forces on which the costs of pensions depend. In this tabulation separate tables had to be prepared for the different classes of city employees which must be distinguished either because of differences in the pension legislation applying to them or because of peculiarities affecting the experience. The following tabular statements show the final form of these tables and give the total of the detail on the sheet; the tables are not presented in their entirety on account of lack of space. Attention is called to the fact that in certain departments select experience tables were developed and in these cases the data were tabulated in a somewhat different form, but for the purposes of the following summary statement the select and ultimate experience have been consolidated.

TABLE 1—SUMMARY OF ACTUAL EXPERIENCE—ACTIVE SERVICE—ALL FUNDS

Fund or Class	Survivors	En-trants	With-drawals	Deaths	Separations by Disability	Service Retirements	Trans-fers	Existing
Police Pension Fund.	9,299	4,341	862	450	1,295	373	...	10,660
Fire Department Relief Fund.....	4,094	1,734	223	161	195	354	15	4,880
Teachers' Retirement Fund:								
Men.....	1,975	895	243	56	11	54	1	2,505
Women.....	13,981	7,320	3,111	362	208	532	1	17,087
Health Department Pension Fund:								
Men.....	890	618	389	44	5	54	56	960
Women.....	323	584	318	9	...	2	32	546
College of the City of New York Retirement Fund.....	203	100	80	6	...	3	...	214
City of New York Employees' Retirement Fund:								
Clerks.....	6,011	8,913	5,083	698	...	40*	1,374	7,729
Laborers.....	8,165	9,218	5,564	1,377	...	39*	1,037	9,366
Mechanics.....	4,333	5,172	3,048	489	...	31*	587	5,350
Department of Street Cleaning Relief and Pension Fund.....	5,236	3,219	2,190	487	372	26	46	5,334
Supreme Court, First Department, Retirement Fund....	214	75	6	35	9	...	1	238
Supreme Court, Second Department, Retirement Fund..	92	46	...	17	...	1*	2	118
Grand Total..	54,816	42,235	21,117	4,191	2,095	1,509	3,152	64,987

*These are technically disability retirements but on account of service limitation they are used as service retirements.

The division of the city employees into classes requires some further explanation. The policemen, the firemen, the school teachers, the street cleaners and the health officers were, of course, distinguished because each of them had its own special fund. All city employees not covered by one of the special funds are legally included under the Grady Law, but they

constitute by no means a homogeneous class. Some division of the employees under this law seemed, therefore, imperative. Various possible bases of division were tested, by comparing the crude rates of separation from the service prevailing in the different occupations and in the different branches of the service, but they were not as satisfactory as was hoped, and finally a simple occupational division was adopted. Three classes were recognized: (1) the clerks, administrators, and technical employees designated in the tables simply as clerks; (2) the mechanics and skilled workers designated simply as mechanics, and (3) the general laborers. All elected, appointed and exempt employees were excluded from the tabulations upon which the experience tables were based because of the probable differences between them and the regular civil service employees in respect to salaries, class of work and tenure of office. The pensions of this special group were valued, however, by use of tables prepared for other groups.

The differences between the experience of men employees and that of women employees require naturally special consideration. In the few divisions where women are employed in large numbers and form a considerable proportion of the total number of employees, as is notably the case in the teaching force, the two sexes were distinguished throughout the valuation. Where the number of women was small they were omitted from the tabulations on which the experience tables were based and their pensions were subsequently valued by the use of the tables for the men.

Pensioners

The following table summarizes the experience tabulated as a basis for mortality tables for employee pensioners. The detail is shown in all cases where it was recorded as a basis for exposure tables, even though such exposure was used only as indicative of the rate to be adopted.

TABLE 2—SUMMARY OF ACTUAL EXPERIENCE—EMPLOYEE PENSIONERS—ALL FUNDS

Fund or Class	Survivors	Entrants	Deaths	Existing
Police Pension Fund:				
Disability Pensioners.....	876	1,307	372	1,811
Service Pensioners.....	803	368	336	835
Fire Department Relief Fund:				
Disability Pensioners.....	185	196	113	268
Service Pensioners.....	334	346	122	558
Teachers' Retirement Fund:				
Men—				
Disability Pensioners.....	1	10	1	10
Service Pensioners.....	34	133	70	97
Women—				
Disability Pensioners.....	79	282	40	321
Service Pensioners.....	773	545	180	1,138
Health Department Pension Fund:				
Disability Pensioners.....	5	5	2	8
Service Pensioners.....	18	58	4	72
Department of Street Cleaning Relief and Pension Fund:				
Disability Pensioners.....	...	307	68	239
Service Pensioners.....	...	24	3	21
Total:				
Disability Pensioners.....	1,146	2,107	596	2,657
Service Pensioners.....	1,962	1,474	715	2,721
Grand Total.....	3,108	3,581	1,311	5,378

TABULATION OF SALARY RECORDS

The tabulations used to determine rates of salary change were based on a period of five years. A five-year period (instead of the six-year period used for the other data) was adopted merely as a matter of expediency. To have based the salary experience on the six-year period would have necessitated the use of an extra punch card because of the amount of information to be recorded, and would accordingly have nearly doubled the amount of work required. The added degree of accuracy thereby achieved could not have compensated for the added expense and labor involved. It is doubtful if the rates based on the six years' experience would have been substantially different from the rates based on five.

In the tabulation for salary scales the cards representing members of the active force were kept separate from those representing persons on pension so that any selection of persons for retirement which might result from differences in salaries could be studied. Each card was tabulated separately for each year's salary reported by an employee, according to the age of such employee at the time the salary was received. The payroll exposure for salary scales was tabulated directly in a form suitable for use. The following table summarizes the total exposure:

TABLE 3—SUMMARY OF EXPOSURE—SALARY—ALL FUNDS

Fund or Class	Number of Annual Salaries	Total Payroll
Police Pension Fund.....	49,846	\$70,135,060
Fire Department Relief Fund.....	22,121	33,682,260
Teachers' Retirement Fund:		
Men.....	11,513	24,123,620
Women.....	77,042	93,072,678
Health Department Pension Fund:		
Men.....	4,508	4,936,150
Women.....	2,331	1,854,860
College of the City of New York Retirement Fund.....	1,011	2,085,850
City of New York Employees' Retirement Fund:		
Clerks—		
Men.....	33,857	46,902,030
Women.....	4,935	4,750,500
Laborers—		
Men.....	42,599	33,776,910
Women.....	2,559	1,129,830
Mechanics.....	23,931	36,105,350
Department of Street Cleaning Relief and Pension Fund....	24,937	20,736,860
Supreme Court, First Department, Retirement Fund.....	1,026	2,327,300
Supreme Court, Second Department, Retirement Fund.....	516	1,162,600
Total.....	302,732	\$376,781,858

COMPILATION OF FAMILY HISTORY STATISTICS

The preceding summaries show the experience which was used as a basis for constructing the tables necessary in the valuation of pensions to the employees themselves. The question of pensions to dependents, that is, widows, children, and dependent parents, must, however, be considered, as pensions to certain members of the family have been allowed in at least four of the pension funds. The experience tables for family history were

at first developed by departments, but after comparison they were consolidated and the resulting set of tables was used for all departments. For this reason all work relating to family history has been covered in a separate section of this report. The following tabular statement gives an idea of the number of reports which were used:

TABLE 4—SUMMARY OF NUMBER OF PERSONS CONSIDERED IN EXPERIENCE FOR FAMILY HISTORY TABLES—ALL FUNDS

Class	Number
Employees.....	22,152
Wives.....	16,376
Widows.....	2,518
Children.....	42,832
Dependent Parents.....	29
Total.....	83,907

TABULATION OF ACTIVE SERVICE AND PENSION ROSTERS

The active service

Tabulations to show the number and salaries of employees in the active service, classified by age and length of service, were made in detail as of June 30, 1914. The following summary shows all active employees who were considered in the valuations. The details are given under the discussion of the specific groups considered.

TABLE 5—SUMMARY OF NUMBER AND SALARIES OF ACTIVE EMPLOYEES CONSIDERED IN VALUATIONS—ALL FUNDS

Fund or Class	Number	Salaries
Police Pension Fund.....	10,783	\$15,169,590
Fire Department Relief Fund.....	5,009	7,515,390
Teachers' Retirement Fund:		
Men.....	2,608	5,713,940
Women.....	17,980	23,170,430
Health Department Pension Fund:		
Men.....	867	968,170
Women.....	395	310,060
College of the City of New York Retirement Fund.....	218	484,100
City of New York Employees' Retirement Fund:		
Clerks—		
Men.....	9,745	12,986,380
Women.....	2,532	2,194,590
Laborers—		
Men.....	10,841	8,449,750
Women.....	1,174	446,930
Mechanics.....	6,064	9,059,650
Special Employees—		
Exempt.....	2,500	4,490,830
Elected.....	172	1,866,000
Appointed.....	160	839,300
Department of Street Cleaning Relief and Pension Fund....	5,426	4,533,370
Supreme Court, First Department, Retirement Fund.....	294	673,550
Supreme Court, Second Department, Retirement Fund.....	138	322,400
Total.....	76,906	\$99,206,430

Pensioners

The number of pensioners on the rolls who were considered in the valuations are shown in the following summary. Details regarding each class will be found under the discussion of the service from which the pensioner was retired.

TABLE 6—SUMMARY OF NUMBER AND PENSIONS OF ALL PENSIONERS CONSIDERED IN VALUATIONS—ALL FUNDS

Fund or Class	Number	Pensions
Police Pension Fund:		
Employees.....	2,716	\$2,010,761
Widows.....	1,441	434,020
Children.....	124	14,830
Dependent Parents.....	1	600
Fire Department Relief Fund:		
Employees.....	899	794,510
Widows.....	669	226,000
Children.....	70	15,040
Dependent Parents.....	48	16,290
Teachers' Retirement Fund:		
Men Employees.....	82	111,720
Women Employees.....	1,439	1,074,170
Health Department Pension Fund:		
Men Employees.....	78	72,910
Women Employees.....	3	1,710
Widows.....	10	3,000
Children.....	1	300
Dependent Parents.....	1	300
College of the City of New York Retirement Fund.....	4	4,330
City of New York Employees' Retirement Fund:		
Clerks.....	43	45,110
Laborers.....	37	18,950
Mechanics.....	26	19,410
Department of Street Cleaning Relief and Pension Fund:		
Employees.....	321	140,790
Widows.....	106	22,100
Children.....	7	410
Dependent Parents.....	3	600
Supreme Court, First Department, Retirement Fund.....	9	10,230
Supreme Court, Second Department, Retirement Fund.....	1	900
Total:		
Employees.....	5,658	\$4,305,501
Widows.....	2,226	685,120
Children.....	202	30,580
Dependent Parents.....	53	17,790
Grand Total.....	8,139	\$5,038,991

EXPOSURE AND CHECK TABLES EMPLOYED

DEVELOPMENT OF MORTALITY AND SERVICE EXPOSURE

From the actual experience tables, summaries of which have already been given, exposed to risk tables were prepared showing by ages the number of persons exposed to the risk of leaving the service from the various causes. The development of the mortality and service exposure tables can perhaps be best discussed under the two headings of active service experience and pensioners' experience.

The active service

The exposure columns for the active service were developed for most of the funds on the aggregate basis, but in a few branches of the service, as has been previously mentioned, the rates of withdrawal in the early years of service were so high that a select basis had to be used for the first years. The method of deriving the aggregate exposure columns where the aggregate basis was used, and the ultimate exposure columns where the select basis was used for the earlier years is shown in the following formula:

$$E_x = E_{x-1} + (b + n - e - \frac{1}{2}t)_x - (w + d + {}^1r + {}^0r + \frac{1}{2}t)_{x-1}.$$

The symbols employed are as follows:

x = age nearest birthday

E_x = the number exposed to risk at age x after any period of service.

b_x = the number of the survivors in the fund at the beginning of the experience at age x .

n_x = the number of entrants during the experience at age x .

e_x = the number existing in the fund at the close of the experience at age x .

The number of separations from the fund during the experience are shown as:

t_x = transfers between the ages of x and $x + 1$.

w_x = resignations and dismissals between the ages of x and $x + 1$.

d_x = deaths between the ages of x and $x + 1$.

1r_x = disability cases between the ages of x and $x + 1$.

0r_x = service retirements between the ages of x and $x + 1$.

The results obtained by the above method were checked by the formula

$$E_x = \sum_{s=0}^{x-x_0} (b + n - e)_s - \sum_{s=0}^{x-x_0-1} (w + d + {}^1r + {}^0r + t)_s - \frac{1}{2}t_x.$$

A summary of the exposure columns for each branch of the active service that was thus treated on the aggregate basis throughout, together with the aggregate exposure of those funds treated on the select basis, is given in the following tables. In order to give a better idea of the experience another column has been added to show the total separations from the service.

**TABLE 7—SUMMARY OF EXPOSURE AND SEPARATIONS—
ACTIVE SERVICE—ALL FUNDS**

Fund or Class	Exposed to Risk	Separations from Service
Police Pension Fund.....	63,330.0	2,980
Fire Department Relief Fund.....	27,210.5	933
Teachers' Retirement Fund:		
Men.....	13,984.5	364
Women.....	98,463.5	4,213
Health Department Pension Fund:		
Men.....	6,120.0	492
*Women.....	1,421.0	231
College of the City of New York Retirement Fund.....	1,383.0	89
City of New York Employees' Retirement Fund:		
Clerks.....	48,925.0	5,821
Mechanics.....	33,388.0	3,568
Laborers.....	62,154.5	6,980
Department of Street Cleaning Relief and Pension Fund.....	35,913.0	3,075
Supreme Court, First and Second Departments, Retirement Funds.....	1,958.5	68
Total.....	394,251.5	28,814

*N. B.—Values for women in Health Department are for first three years of service only.

For the branches of the service where the select basis was used for the earlier years—namely, the Health Department Pension Fund, the Department of Street Cleaning Relief and Pension Fund, and the three divisions under the City of New York Employees' Retirement Fund, the actual experience data were tabulated by separate years of service for the number of years that seemed essential. From these tabulations each select exposure column was derived by use of the formula:

$$E_{[x]+t} = n_{[x]} + \sum_{i=0}^{t-1} (b - e)_{[x]+i} - \sum_{i=0}^{t-1} (w + d + {}^i r + {}^0 r + t)_{[x]+i} - \frac{1}{2} t_{[x]+t}$$

where

$E_{[x]+t}$ = number exposed to risk at age $x + t$ in their $(t + 1)$ th year of service after entering at age x .

$n_{[x]}$ = number of employees who entered service during the period of experience at age x .

$b_{[x]+t}$ = number of survivors at the beginning of the experience with a service of exactly t years after entry at age x .

$e_{[x]+t}$ = number existing at end of experience with a service of exactly t years after entry at age x .

$w_{[x]+t}$; $d_{[x]+t}$; ${}^i r_{[x]+t}$; ${}^0 r_{[x]+t}$; $t_{[x]+t}$ * = number of employees leaving the service for various causes during their $(t + 1)$ th year of service after entry at age x .

For a detailed presentation of the exposure columns derived by the use of this method, reference should be made to the separate discussion under each branch of the service for which the select basis was used.

*NOTE—Large lower case t indicates transfers and must not be confused with small t used as a subscript, which represents time.

Pensioners

Exposure columns for the pensioners were developed from their actual mortality experience by use of the formulae similar to those used for the branches of the active service where the aggregate basis was employed. A formula of this type was used instead of the ordinary formula for mortality exposure because of the necessity of developing rates of marriage and of revocation in addition to death rates for widows. In the case of employee pensioners the symbol *w* was not employed as there were no terminations of pensions by causes other than death.

The general formula employed was

$$E_x = E_{x-1} + (b + n - e)_x - (d + w)_{x-1}$$

and the work was checked by

$$E_x = \sum_{x=0}^{x=x} (b + n - e)_x - \sum_{x=0}^{x=x-1} (d + w)_x$$

The following table gives a summary of the exposure columns for service pensioners and for disability pensioners, together with a statement for each class of the number of deaths and revocations combined. Similar data relating to dependents will be found in the discussion of family history statistics.*

TABLE 8—SUMMARY OF EXPOSURE AND SEPARATIONS—
EMPLOYEE PENSIONERS—ALL FUNDS

Fund or Class	Service Pensioners		Disability Pensioners	
	Exposed to Risk	Deaths	Exposed to Risk	Deaths
Police Department Pension Fund.....	5,105	336	8,445	372
Fire Department Relief Fund.....	2,859	122	1,420	113
Teachers' Retirement Fund:				
Men.....	855	70	33	1
Women.....	5,885	180	1,437	40
Health Department Pension Fund.....	240	4	44	2
College of the City of New York Retirement Fund.....	...	...	...	...
City of New York Employees' Retirement Fund:				
Clerks.....	...	...	...	...
Laborers.....	...	...	...	...
Mechanics.....	...	...	...	...
Department of Street Cleaning Relief and Pension Fund.....	26	3	364	68
Supreme Court, First and Second Departments Retirement Funds.....	...	...	...	...
Total.....	14,970	715	11,743	596

NOTE.—The experience was insufficient to justify tabulation in departments for which no figures are given.

* For these data see page 348.

GRADUATION OF UNADJUSTED RATES

Unadjusted rates were prepared from the exposure tables. Such rates as

$$\frac{w_x}{E_x}; \frac{d_x}{E_x}; \frac{{}^0r_x}{E_x}; \frac{{}^1r_x}{E_x};$$

were used where the exposure was of sufficient magnitude to give satisfactory results and in cases where the exposure was light the data were combined in five-year groups and unadjusted rates were derived for the central years.

The graphic method of graduation was employed practically throughout the work as it has a marked advantage over the methods of finite differences in work of this kind where the data are not very extensive and where the character of the curve oftentimes undergoes frequent changes. The advantages of the graphic methods were enhanced by plotting the unadjusted values on a co-ordinate paper, having the ordinate divided according to a mathematical series so that the smaller decimals of low rates in the earlier ages could be plotted on the same sheet with the rates for the later ages and still be on a scale of sufficient magnitude to permit of their being read accurately to four significant figures. The divisions along the abscissa were equally spaced and represented years and half years. Paper so ruled furnished the means of obtaining the maximum mechanical assistance from the spline and permitted the entire curve to be considered at one time. Indeed, many of the curves were derived from a single sweep of the spline. The paper employed was 24 by 34 inches in size; its general form is indicated by the charts presented in this report, although much of the ruling has been omitted to facilitate reproduction.

CHECKING OF RATES BY COMPARISON WITH SIMILAR RATES DERIVED IN OTHER VALUATIONS

All adjusted rates derived by graduation were checked back to the original data by the customary method of comparing the actual cases with the expected and accumulating the differences. Rates given as derived from the original data all check very closely with these data and, unless so stated in the text, have not been increased nor decreased to make them either more or less conservative from the standpoint of the solvency of the funds. This point must be borne in mind by any one using the tables as a basis for calculating premium or contribution rates for the pension systems.

Comparisons between the various derived rates and similar rates in other funds were made frequently during the preparation of the rates as a check on the accuracy of the work, but such comparisons cannot be shown in the report because of lack of space. In the preparation of rates for certain funds every rate derived could be contrasted with one or more comparable rates in similar funds, whereas for certain other funds no comparisons could be made because no comparable rates from other funds were available. In such cases the best that could be done was to compare the rates first with those in funds covering persons of a somewhat similar class,

where the rates might reasonably be supposed to be higher and then with rates of other similar classes where they might reasonably be supposed to be lower.

A simple method of making such comparisons with rates in other services was found effective. All rates of a given type which the Commission was able to secure were plotted on a sheet of transparent paper. These sheets were of exactly the same size as those used by the Commission in plotting the curves which it developed and they were prepared with exactly the same scales and rulings. As soon, for example, as a mortality curve was developed by the Commission the transparent sheet carrying the mortality curves obtained from other funds was placed over it. The new curve was thereby shown among all other available curves which were comparable and any similarity between it and the curve of any other fund was immediately apparent whether the similarity in form or in magnitude existed throughout or only within certain age limits. Such comparisons facilitated intelligent graduation of the rates and in cases where the basic data were meagre the procedure was most helpful as it tended to indicate whether the rates to be used should be based solely on the graduated experience or whether they should be modified to make them conform with some other more extensive and apparently more reliable experience.

That this work necessitated a considerable exercise of judgment and discretion and was beset with many difficulties must be borne in mind throughout the discussion of the various funds. In some funds the experience relating to certain separations from the service was apparently adequate, whereas that relating to others was obviously insufficient. Disability rates in some cases, therefore, had to be based on those prevailing in other funds, and compensating allowances had to be made in the rates of resignation, dismissal, death, etc., based on the actual experience; in other cases the rates of death or disability could be secured from the experience but they had to be subdivided, according to the occurrence or non-occurrence of the event, while the employee was in actual performance of duty, on the basis of rates from other sources. Over 250 graduated rates of this type had to be developed and consequently the small staff available for the undertaking was forced to resort to every mechanical aid available and the work had to be so divided that employees skilled in graduation could devote their entire time to it, leaving all routine tasks in the nature of checking and verifying to computing machine operators.

In the preparation of some of the rates where the data were scarce the graduator was forced to use his best judgment as to what rate should be accepted as correct; however, no attempt has been made to conceal the fact in cases where such procedure was necessary, and wherever the rates are based at all upon the exercise of discretion, this fact is stated in the text. Naturally every effort has been made to obtain the most reliable set of basic rates possible at the present time. In the future the rates will doubtless have to be corrected from time to time to meet changes in the effectiveness of pension administration, and in the general changes which affect the conditions of health and the hazards of the employees. It is believed, however, that in the aggregate the rates here given represent the most reliable and the most scientific bases on which any premium rates or estimates of future cost may be predicated at this time.

CONSTRUCTION OF MORTALITY AND SERVICE TABLE

AGGREGATE TABLES

Aggregate mortality and service tables were prepared by the direct application of the decrement rates to an assumed radix. The general active service table with four decrement columns was developed as follows:

$$l_{x+1} = l_x - (w + d + {}^i r + {}^o r)_x$$

where

$$w_x = l_x \cdot {}^w q_x; d_x = l_x \cdot {}^d q_x; {}^i r_x = l_x \cdot {}^i r_x; {}^o r_x = l_x \cdot {}^o r_x.$$

${}^w q_x$ = rate of withdrawal by resignation and dismissal.

${}^d q_x$ = rate of mortality in service.

${}^i r_x$ = rate of disability retirement.

${}^o r_x$ = rate of regular or service retirement.

and it might be added that

${}^w q_x$ = rate of withdrawal by dismissal.

${}^w q_x$ = rate of withdrawal by resignation.

$$\therefore {}^w q_x = {}^w q_x + {}^w q_x.$$

${}^d q_x$ = rate of death by accident.

${}^o d q_x$ = rate of death from other causes.

$$\therefore {}^d q_x = {}^d q_x + {}^o d q_x.$$

The l_x column was checked by

$$l_{x+1} = l_x [1 - ({}^w q + {}^d q + {}^i r + {}^o r)_x]$$

and the entire table by

$$l_x = \sum_{x=\omega}^{\infty} (w + d + {}^i r + {}^o r)_x.$$

The symbol " ω " will be used throughout to indicate the highest age shown in the table being considered.

Similar methods were employed in constructing mortality tables for pensioners. Attention is called to the fact that in the tables a small letter has been affixed to the symbols to indicate the class to which the symbol applies; for example, the small (a) indicates that the symbol was taken from a table dealing with the active service; the affix (p) indicates that the symbol applies to regular pensions; the affix (i) indicates that the symbol applies to disability pensions, etc. In the general formulae given in the first part of this section the limiting affix has been considered unnecessary and therefore omitted.

TABLES IN SELECT FORM

Tables on a select basis were not adopted because of any desire to introduce further refinement in the work but because such a basis seemed the most feasible method of overcoming the difficulties presented by the wholesale separations from the service that are characteristic of the earlier years of employment, in certain branches of the city government. To have

applied the customary method of constructing tables on a select basis in developing the service and mortality tables for those branches of the service for which the select basis had to be employed would have necessitated an expenditure of time and money that seemed almost prohibitive. Tables which on an aggregate basis would have consisted of five, six or seven columns would have contained on the ordinary select basis, twenty, twenty-four or twenty-eight columns; and for many of the added columns commutation columns and special reserve values would have been required.

Methods were tested whereby certain classes, such as those with six months, a year, a year and a half, or even two years of service, were excluded from the basis of the experience, but the results did not commend them for use. A select basis seemed imperative. Finally a method was devised which gave practically the same results as the ordinary method but which did not involve as great an amount of labor in its application. Although the method is supposedly new, its application is simple. Briefly stated, it consisted in developing those rates which are most strongly influenced by the employees' length of service, namely, the rates of resignation and dismissal, directly from the experience tabulated on a select basis, for the minimum number of select years necessary, and to develop all other rates from the ultimate experience. The select rates for the other contingencies, such as death, invalidity and regular retirement were made up not by the use of the experience of the first two or three years but by the use of modifications of the ultimate rate. The work was so handled that these modifications of the ultimate rates, when used in the development of a select table, would give in certain decrement columns the same numerical value to the decrement for any one age and cause, no matter what the length of service. The ultimate table was constructed by the same method used for the aggregate tables; the only difference being that rates developed from the ultimate experience were used in place of aggregate rates. The method employed in adding the select columns may be expressed symbolically, in the case of a table having the rates of resignation and dismissal thus derived from the select experience and other rates from the ultimate, as follows:

$$l_{[x]+t} = \frac{l_{[x]+t+1} + (d + {}^i r + {}^o r)_{x+t}}{1 - ({}^w q + {}^a q)_{[x]+t}},$$

$${}^a w_{[x]+t} = l_{[x]+t} \cdot {}^a q_{[x]+t}; \quad {}^r w_{[x]+t} = l_{[x]+t} \cdot {}^r q_{[x]+t},$$

and as previously mentioned

$$d_{[x]+t} = d_{x+t}; \quad {}^i r_{[x]+t} = {}^i r_{x+t}; \quad \text{etc.,}$$

therefore the select rates shown in the charts, where not developed from the experience were derived as follows:

$${}^a q_{[x]+t} = \frac{d_{x+t}}{l_{[x]+t}}; \quad {}^r q_{[x]+t} = \frac{{}^i r_{x+t}}{l_{[x]+t}}; \quad \text{etc.}$$

Perhaps a better understanding of the procedure can be obtained by referring to one of the tables in select form shown later in this report. (See pages 145-148). The use of a table thus constructed removes the necessity of computing additional commutation columns except for values

involving the columns for resignation and dismissal, though of course the commutation columns based on the number living had to be developed just as in the ordinary select table. The necessity of carrying the valuation detail on a select basis is not obviated by the use of such tables; however, the method effected a very great saving of time over what would have been required had the valuations been made on a select table developed in the customary manner.

PREPARATION OF SALARY SCALE

The salary scale is simply a series of ratios developed by graduating the average salaries of employees classified by age. The salary data for persons on the pension roll were kept separate from those for active employees, as has previously been noted, in order that any selection of higher or lower priced employees for retirement on pension might be studied. Not only were the two classes kept separate in the tabulations, but their respective salary scales were graduated separately before the final salary scales were constructed. It was thought that a salary scale thus developed could be used more safely than one derived directly from the data for the active force alone or from all data combined without distinction. A single salary scale was constructed for each department except the Health Department. A discussion of the scales employed in the Health Department will be found under that section of the report relating to that particular branch of the service.

Tests of the salary scales were made during the progress of the work by taking the salaries of employees in certain departments as they were a few years ago, estimating what they would be during the next few years according to the salary scale, and then comparing the results with the actual salaries. This test was made for the Fire Department. The salaries of all employees who had remained in the service for three years were taken as of the beginning of the first year and by the use of the salary scale for that department their salaries for each of the succeeding three years were estimated. The results were then compared with the salaries which this group of employees had actually received and in no year was a difference of more than 1% found between the total actual salaries and the total estimated salaries. These results were considered good, but it was thought that the test might have been unduly favorable to the salary scale because the scale had been developed from the experience during a period which included the three years tested; consequently a test was made for the Police Department, for which a salary scale was available, developed on the experience ending in 1912. Actual salaries were compared with salaries estimated by means of the old salary scale, and the correspondence was even closer than in the case of the Fire Department, a fact which seemed to indicate that the use of salary scales for estimating future salaries is justified. If the experience be watched closely and the scale modified from time to time, if necessary, rates of salary change would appear to be as reliable as certain other rates that have been generally accepted as proper and suitable bases for pension fund calculations.

INTEREST RATE ADOPTED

An interest rate of 4% was used in making the computations.

DERIVATION OF MONETARY VALUES

The valuations were prepared by computing for each age the reserve required for a salary of one to meet each pension benefit allowed under the fund and then multiplying the results thus obtained into the salaries of the employees at that age. In benefits dependent on years of service as well as age, the salaries of employees at a given age were grouped by five-year service periods and were valued by use of the reserve for the central year of each group. In funds where select tables were necessary, the employees who had less than four years' service were not, of course, grouped in five-year periods. So many pension benefits are involved in the various funds that it is not practicable to present all the formulæ used. A few general formulæ may, however, be given to indicate the general methods followed in preparing reserve values and contribution or premium rates. All symbols appearing in the following formulæ which are not there defined will be found in the headings of the mortality and similar tables presented in the discussion of the individual funds. In the formulæ an attempt has been made to secure practical accuracy and to avoid refinements which did not seem warranted by the extent and accuracy of the basic data. The equality sign has therefore been employed in the formulæ wherever its use was considered practically accurate, including cases in which a slight mathematical inequality was involved, resulting simply from the absence of some such nice refinement.

The formulæ given are those directly applicable for use in connection with aggregate tables. When tables in the select form were employed, the reserves were computed in the same general manner; the only difference was that in place of values taken from aggregate tables as shown in the formulæ, corresponding values were taken from the select tables.

All formulæ relating to the valuation of pensions to dependents are given in the section of the report dealing with statistics of family history.

CONTRIBUTION ANNUITIES

- (A) The present value of the total future salaries of employees in the service at age x was computed as follows:

$l_x^{(a)}$ = number living at age x according to active service table.

$$D_x = l_x^{(a)} \cdot v^x$$

$$D'_x = s_x D_x$$

$$N'_x = \sum_{x=x+1}^{x=\infty} D'_x$$

$$a_x = \frac{N'_x}{D'_x}$$

$$\bar{a}_x = \frac{N'_{x-1}}{D'_x} = \text{present value equated to a salary of one.}$$

$$\begin{aligned} \therefore \bar{a}_x \cdot [\text{present salary of employees at age } x] \\ = \text{present value of total future salary.} \end{aligned}$$

In funds where tables in the select form were used the salaries of employees were classified by length of service and separate values were computed for each class.

DISABILITY BENEFITS

The legal provisions of the different funds in respect to the payment of disability pensions present numerous variations; benefits are made contingent on the employee having served a certain minimum period before the breakdown, or on the disability having occurred in performance of duty, etc. To show the formulæ employed in every case would require so much space that such procedure has not been considered feasible. The following formulæ apply to the more general disability pension provisions. The special formulæ used for specific benefits were developed by similar principles.

(B) The present value of disability pensions payable after certain definite periods of service, such as ten years, based on final salary, for employees in the service at age x was computed in the following manner:

$l_x^{(i)}$ = number living at age x according to the disability pensioners' table.

$$D_x^{(i)} = l_x^{(i)} \cdot v^x, \quad N_x^{(i)} = \sum_{x=x+1}^{\infty} D_x^{(i)},$$

$$\bar{a}_x^{(i)} = \frac{N_{x-\frac{1}{2}}^{(i)}}{D_x^{(i)}}, \quad \bar{a}_{x+\frac{1}{2}}^{(i)} = \frac{1}{2}(\bar{a}_x^{(i)} + \bar{a}_{x+1}^{(i)}).$$

${}^i r_x^{(a)}$ = disability retirements between the ages of x and $x+1$, according to the active service table.

$${}^i r_x^{(a)} \cdot v^{x+\frac{1}{2}} \cdot \bar{a}_{x+\frac{1}{2}}^{(i)} = {}^i \bar{C}_x,$$

$$s_{x+\frac{1}{2}} = \frac{1}{2}(s_x + s_{x+1}),$$

$${}^i \bar{C}_x^* = s_{x+\frac{1}{2}} \cdot {}^i \bar{C}_x,$$

$${}^i \bar{M}_x^* = \sum_{x=x}^{\infty} {}^i \bar{C}_x^*.$$

Let n = years of service of employee, with the condition that whenever it appears in a formula, it shall not be given a greater value than the number of years of service required for the employee to become eligible for the pension benefit under consideration.

If n = years of service of employees, where maximum years considered is 10, then the value of the pension equated to a salary of one at age x , for an employee with n years of service is

$$\frac{{}^i \bar{M}_{x+10-n}^*}{D_x^*}$$

and

$$\frac{{}^i \bar{M}_{x+10-n}^*}{D_x^*} \cdot \left[\frac{\text{Present salaries of employees at age } x}{\text{with } n \text{ years of service}} \right]$$

= present value of disability pensions of half salary on disability after 10 years' service.

Expressing the value of such a pension of one half salary on disability as a percentage of annual salary to be contributed during active service, we have

$$\frac{50' \bar{M}_{x+10-n}'}{N_{x-1}'} = \text{percent of salary to be contributed to provide the} \\ \text{above disability pension for an employee now} \\ \text{at age } x \text{ with } n \text{ years of service.}$$

- (C) The present value of disability pensions payable after certain definite periods of service, such as ten years, based on both final salary and length of service, for employees in the service at age x , was calculated as follows:

$${}^n\bar{R}_x = \sum_{n'=0}^{x-n} {}^n\bar{M}_x.$$

The symbol n' will be used throughout to indicate the years of service of employee in excess of maximum which can be given to n , so that $(n + n') = \text{actual years of service}$.

Using these new symbols, in connection with those already developed, we have the value of the pension equated to one of salary at age x , as

$$\frac{(10 + n') {}^n\bar{M}_{x+10-n}' + {}^n\bar{R}_{x+10-n}'}{D_x'}.$$

If the allowance on retirement be $1\frac{2}{3}\%$ of final salary for each year of service, then

$$\frac{(10 + n') {}^n\bar{M}_{x+10-n}' + {}^n\bar{R}_{x+10-n}'}{D_x'} \left[\frac{\text{Present salary of employees at} \\ \text{age } x \text{ with } (n + n') \text{ years' service}}{60} \right]$$

= present value of pension of $1\frac{2}{3}\%$ percent of final salary for each year of service on disability after 10 years' service.

The percentage of salary required to provide this benefit is shown in the following:

$$\frac{\frac{10}{6} [(10 + n') {}^n\bar{M}_{x+10-n}' + {}^n\bar{R}_{x+10-n}']}{N_{x-1}'}$$

= percentage of salary to be contributed to provide for pension of $1\frac{2}{3}\%$ percent of final salary for each year of service on disability after 10 years' service.

REGULAR OR SERVICE BENEFITS

Among the pension funds discussed in this report none is confined to a superannuation benefit allowable on the sole condition that the employee has reached a certain age, although many have a provision permitting retirement at a certain age provided the minimum requirement as to length of service has been fulfilled. In other funds service benefits may be claimed by the employees after certain definite periods of service regardless of age. The laws do not provide that employees must retire on becoming eligible; retirement is optional, and consequently it is necessary in all cases to employ a retirement rate.

In valuing benefits granted only on the fulfilment of service and age conditions it was necessary to combine methods suitable for valuing superannuation pensions with those applicable to the valuation of service pensions. In illustrating the methods used, therefore, general formulæ for service retirements will be shown first and then a simple combination formula will be given. Attention is called to the fact that maximum and minimum limitations of the amount of benefits to be paid are not considered in the formulæ presented. Where these limitations were fixed at a certain proportion of the salary the adjustments were added in the formulæ; where they were fixed at certain definite amounts, approximations were employed, based on the distribution of salaries at the different ages, which showed, of course, what proportions of total salaries would be affected by the limitations.

Benefits limited by years of service only

- (D) The present value of pensions payable after certain definite periods of service, such as 30 years' service, where the amount of the pension is based on last salary, to employees in the service at age x , was calculated in the following manner:

$l_x^{(p)}$ = number living at age x according to regular pensioners' table.

$$D_x^{(p)} = l_x^{(p)} \cdot v^n, \quad N_x^{(p)} = \sum_{x=x+1}^{\infty} D_x^{(p)},$$

$$\bar{a}_x^{(p)} = \frac{N_{x-\frac{1}{2}}^{(p)}}{D_x^{(p)}}, \quad \bar{a}_{x+\frac{1}{2}}^{(p)} = \frac{1}{2}(\bar{a}_x^{(p)} + \bar{a}_{x+1}^{(p)}).$$

$o_{x+1}^{(a)}$ = regular or service retirements between the ages of x and $x+1$, according to active service table.

Before proceeding further with the formula, attention should be called to the introduction of an approximation to allow for an understatement that arises from the use of regular or service retirement rates developed on an aggregate basis. All the retirements on service or superannuation pensions at a given age are necessarily those of persons who are eligible for retirement, having fulfilled the age and service conditions; whereas in the exposure column at that age are some who have not yet fulfilled the minimum service requirement, having entered the service at a later date than those who have retired. The retirement rates as derived on the aggregate basis are therefore lower than they would have been had the exposure column included only those who were eligible to retire. If the rates as developed without consideration of this factor are applied to persons who are now in the service, having entered at ages which mean they will all be eligible for retirement when a certain age is reached, provided they remain in the service that long, the number of retirements and the cost will be understated. The more scientific method of valuing the benefits under these conditions would be to use select rates based solely upon those eligible to retire, but the factors of time and the breadth of the experience rendered such a course impracticable. An allowance has therefore been made to produce more nearly the results which would have been obtained through the use of rates developed on a select basis.

The method adopted was as follows: All employees of the same age and length of service were, of course, considered in one group by themselves and thus the earliest age at which they could fulfil the minimum age and service requirements and become eligible for retirement on service pension was apparent at a glance. All persons shown by the active service table to have retired on such pensions at earlier ages than the age at which this special group would become eligible were assumed, for the purpose of valuing the benefits for this group, to have remained in the service until the minimum age at which this group would be eligible and thereupon to have retired immediately. The method shows a high rate in the first year, reflecting the probable action of selection, and gives results in substantial harmony with certain data from pension funds which were available for testing its applicability. It seemed the most reliable method available, and although necessarily empirical it is believed that if it err in any way, the variation tends to slightly understate rather than overstate the amount of the liability. In the valuations presented in this report the intention is not to show the maximum liabilities that may be involved, but rather the minimum liabilities for which no assets have been provided. This fact should not be forgotten in using a formula of this type in the calculation rates to be employed by a reorganized fund.

Continuing the development of the formula,

$${}^0r_x^{(a)} \cdot v^{n+\frac{1}{2}} \cdot \bar{a}_{x+\frac{1}{2}}^{(p)} = {}^0\bar{C}_n$$

$$s_{n+\frac{1}{2}} \cdot {}^0\bar{C}_n = {}^0\bar{C}_x^s$$

$${}^0\bar{M}_x^s = \sum_{n=0}^{x-30} {}^0\bar{C}_n^s$$

$${}^d q_x^{(a)} = \text{rate of mortality in active service.}$$

$${}^d p_x^{(a)} = [1 - {}^d q_x^{(a)}],$$

$${}^0l_x^{(a)} = ({}^0l_{x-1} + \frac{1}{2} {}^0l_{x-1}^{(a)}) \cdot {}^d p_{x-1}^{(a)} + \frac{1}{2} {}^0l_{x-1}^{(a)},$$

$${}^0l_x^{(a)} \cdot v^n \cdot s_n = {}^0{}_1D_x^s$$

$${}^0{}_1N_x^s = \sum_{x=30}^{x+30} {}^0{}_1D_x^s$$

$$\bar{a}_x^{(p)} \cdot {}^0{}_1D_n^s = {}^0{}_1C_n^s$$

If n = years of service of employees, where maximum years considered is 30, then the value of the pension equated to a salary of one at age x for an employee with $(n + n')$ years' service, is

$$\frac{{}^0\bar{M}_{x+30-n}^s + {}^0{}_1C_{x+30-n}^s}{D_x^s + {}^0{}_1D_x^s}$$

and

$$\frac{{}^0\bar{M}_{x+30-n}^s + {}^0{}_1C_{x+30-n}^s}{D_x^s + {}^0{}_1D_x^s} \left[\frac{\text{Present salaries of employees at age } x \text{ with } (n + n') \text{ years' service}}{2} \right]$$

= present value of pensions of one half salary on retirement after 30 years' service.

Expressing the value of such a pension of half salary as a percentage of annual salary to be contributed during active service, we have

$$\frac{50({}^0\bar{M}_{x+30-n} + {}^0C'_{x+30-n})}{N_{x-\frac{1}{2}} + {}^0N'_{x-\frac{1}{2}} - {}^0N'_{x+30\frac{1}{2}-n}} = \text{percent of salary to be contributed}$$

to provide the above service pension for an employee now at age x with $(n + n')$ years of service.

In the preceding formulæ and in the formulæ which follow, the values based on the ${}^0I_x^{(a)}$ column are omitted in valuing pensions to persons in the active service who have completed the maximum requirement of service or attained the age of eligibility.

- (E) The present value of pensions payable after certain periods of service, such as 30 years of service, where the amount of the pension is based both on last salary and length of service, to employees in the service at age x , was developed as follows:

Using the symbols previously developed and adding,

$${}^0\bar{R}_x = \sum_{x=0}^{x=30} {}^0\bar{M}_x,$$

we have the general formula

$$\frac{(30 + n')[{}^0\bar{M}' + {}^0C']_{x+30-n} + {}^0\bar{R}'_{x+30\frac{1}{2}-n}}{D'_x + {}^0D'_x}.$$

as the value of the benefit, equated to a salary of one at age x , for an employee with $(n + n')$ years of service.

Assuming that the pension payable is one and two-thirds per cent. of final salary for each year of service, then

$$\frac{(30 + n')[{}^0\bar{M}' + {}^0C']_{x+30-n} + {}^0\bar{R}'_{x+30\frac{1}{2}-n}}{D'_x + {}^0D'_x} = \left[\begin{array}{l} \text{Present salaries of} \\ \text{employees at age} \\ x \text{ with } (n + n') \\ \text{years of service} \\ \hline 60 \end{array} \right] = \text{present value of pensions of}$$

1 $\frac{2}{3}$ percent of final salary for each year of service on retirement after 30 years' service.

Expressing the value of such a benefit of 1 $\frac{2}{3}$ % of final salary for each year of service as a percentage of annual salary to be contributed during active service, we have

$$\frac{\frac{10}{3} \{ (30 + n')[{}^0\bar{M}' + {}^0C']_{x+30-n} + {}^0\bar{R}'_{x+30\frac{1}{2}-n} \}}{N'_{x-\frac{1}{2}} + {}^0N'_{x-\frac{1}{2}} - {}^0N'_{x+30\frac{1}{2}-n}}$$

= percent of salary to be contributed to provide the above service pension for an employee now age x with $(n + n')$ years of service.

Benefits limited by both years of service and age

For a simple example of a benefit limited both by length of service and age of employee, we may consider the formulæ required to value the benefits allowed under a specific pension provision in one of the funds considered. The law for this fund provides:

(F) Pension of one-half final salary at age 60, or payable after 20 years' service if employee has attained age 55.

This may be valued by use of the general formula developed under (D) supra, provided certain changes and limitations be employed in determining the value of the subscripts to the symbols.

Obviously employees who entered the service at age 35 or younger will all have had 20 years of service at age 55 and consequently they will not be affected by the limitations regarding service or the age limitations of 60 years. For this class the general expression

$$\frac{{}^n\bar{M}'_{55} + {}^nC'_{55}}{D'_x + {}^nD'_x}$$

may be employed.

Similar reasoning will show that for employees entering at age 40 or older, the limitation regarding retirement at age 60 will be the only one that need be considered. The expression

$$\frac{{}^n\bar{M}'_{60} + {}^nC'_{60}}{D'_x + {}^nD'_x}$$

will cover this group.

For employees entering at age 36, the retirement limitation will be 56; for those entering at age 37, the limitation will be 57 and so on, so that in general

$$\frac{{}^n\bar{M}'_{x+n-n} + {}^nC'_{x+n-n}}{D'_x + {}^nD'_x} \left[\frac{\text{Present salaries of employees at age } x \text{ with } (n + n') \text{ years of service}}{2} \right]$$

= present value of pension of half salary on retirement.

if we remember that $x - n$ must be used as 35 where its true value is 35 or less, and that it must be used as 40, where its true value is 40 or more. In other cases the true value is the one to be used.

The percentage contribution is developed in the same manner as that derived under (D) provided the specific limitations be kept in mind.

SECTION II

**VALUATION OF INDIVIDUAL FUNDS WITH A DESCRIPTION
OF SUCH SPECIAL METHODS AS THE PECULIARITIES
OF EACH REQUIRED**



POLICE PENSION FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Police Pension Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

TO EMPLOYEES

- (1) In discretion of Police Commissioner after 20 years of service, or upon application after 25 years' service, if employee has attained age 55, a pension of not less than one-half final salary. All members are eligible for retirement at age 60, regardless of length of service.

The average allowance has been about 50 per cent. of final salary.

- (2) Upon disability incurred in the actual performance of duty, a pension of from one-quarter to one-half final salary.

The average allowance has been about 37 per cent. of final salary.

- (3) Upon disability on account of ordinary causes after 10 years' service, a pension of not less than one-quarter of final salary.

The average allowance has been about 48 per cent. of final salary.

Pensions to employees are for life and are not revocable if granted under provision (1) or provision (3) after 20 years' service.

TO WIDOWS OF EMPLOYEES OR PENSIONERS

- (4) Upon death of an employee in the actual performance of duty, a pension of a discretionary amount not to exceed \$600 per annum.

The average annuity has been about \$465.

- (5) Upon death of an employee from ordinary causes after 10 years' service, a pension of a discretionary amount, not to exceed \$300 per annum.

The average annuity has been about \$300.

- (6) Upon death of a pensioned employee, a pension of a discretionary amount, not to exceed \$300 per annum.

The average annuity has been about \$300.

Pensions to widows are terminated automatically by the death or re-marriage of the widow and are revocable.

TO CHILDREN OF EMPLOYEES OR PENSIONERS

- (7) Upon death of an employee in actual performance of duty, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$600 per annum.

The average annuity during the lifetime of the youngest child has been about \$250.

- (8) Upon death of an employee resulting from causes not connected with the performance of duty after 10 years' service, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$600 per annum.

The average annuity during the lifetime of the youngest child has been about \$250.

- (9) Upon death of a pensioned employee, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$600 per annum.

The average annuity during the lifetime of the youngest child has been about \$250.

Pensions to children are terminated by death, marriage or attainment of age 18.

TO DEPENDENT PARENTS OF EMPLOYEES

- (10) Upon death of an employee in actual performance of duty, provided there be neither widow's nor child's pension, a pension not to exceed \$600 per annum.

For lack of sufficient experience the average allowance to dependent parents was made the same as that to widows of employees killed in the actual performance of duty.

Pensions to dependent parents are terminated by death or remarriage and are revocable.

Contributions

BY EMPLOYEES

Two percentum of salary.

BY CITY

Indirect contributions:

Miscellaneous revenues, such as excise moneys, permit fees, salary deductions for absences and fines; unexpended balances of salary appropriations, etc.

Direct contributions:

Budgetary appropriations to supplement other revenues as required to meet maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in the actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305 of this report.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The schedules for employees were divided into two classes, one including the uniformed force, which is governed by the Police Pension Fund, and the other including the civilian employees who are covered by the City of New York Employees' Retirement Fund. The former class only is considered in this section of the report. The schedules for the latter class were further subdivided and included under the various divisions of the City of New York Employees' Retirement Fund.

Special methods of handling data

The general methods employed in developing the data to show unadjusted rates were those previously outlined. The active service rates used, however, were not developed from the data recorded by the Commission, but were based on data collected previously.

In 1913 the Bureau of Municipal Research of New York submitted to the Aldermanic Committee on Police Investigation a report on the Police Pension Fund which contained an actuarial valuation of that fund. This report presents rates based on the experience of the force for a period of six years. The expected experience derived by the use of those rates has been checked by the Commission against the experience of the Police Pension Fund during the years succeeding that investigation. The difference between the actual and the expected experience was so small that it seemed unnecessary to modify the active service table prepared at that time. The division of the rates of disability and withdrawal are not shown in the previous report, but for the purpose of this report they have been divided. The experience of the fund has of course been used as the basis for this division.

The mortality experience recorded by the Commission was slightly lower than would have been expected from the previous investigation; being about 7 per cent. lower in the case of disability pensioners and about 8 per cent. lower in the case of service pensioners. Because of these differences the mortality rates for pensioners were developed from the experiences in accordance with the general methods discussed in the first section of this report.

The following tables show the extent of the experience:

**TABLE 9—SUMMARY OF EXPOSURE AND SEPARATIONS—
ACTIVE SERVICE
Police Pension Fund**

Number Exposed to Risk.....	63,330
Total Number of Separations.....	2,980
Total Withdrawals.....	862
Resignations.....	311
Dismissals.....	551
Total Deaths.....	450
In Performance of Duty.....	23
Other Causes.....	427
Total Separations by Disability.....	1,295
In Performance of Duty.....	89
Other Causes.....	1,206
Total Service Retirements.....	373

TABLE 10—SUMMARY OF EXPOSURE—SALARY**Police Pension Fund**

Class	Number of Annual Salaries	Total Payroll
Active Members.....	47,022	\$65,654,710
Pensioned Members.....	2,824	4,480,350
Total.....	49,846	\$70,135,060

**TABLE 11—SUMMARY OF EXPOSURE AND SEPARATIONS—
EMPLOYEE PENSIONERS****Police Pension Fund**

Class	Exposed to Risk	Deaths
Disability Pensioners.....	8,445	372
Service Pensioners.....	5,105	336
Total.....	13,550	708

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 47 and 48, showing the rates plotted on cross-section paper.

TABLE 12—RATES OF SEPARATION FROM ACTIVE SERVICE
Police Pension Fund

AGE	RATE OF WITHDRAWAL			RATE OF DEATH			RATE OF DISABILITY			Rate of Service Retirement		Total Rate of Separation
	Resignation $rwq_z^{(a)}$	Dismissal $dwq_z^{(a)}$	Total $wq_z^{(a)}$	In Performance of Duty $sdq_z^{(a)}$	Other Causes $odq_z^{(a)}$	Total $dq_z^{(a)}$	In Performance of Duty $strq_z^{(a)}$	Other Causes $otrq_z^{(a)}$	Total $trq_z^{(a)}$	$orq_z^{(a)}$		
20	.0450	.0113	.0563	...	.0026	.0026	.0006	...	.0006	...	.0595
21	.0360	.0116	.0476	...	.0026	.0026	.0007	...	.0007	...	.0509
22	.0281	.0119	.0400	.0001	.0027	.0028	.0009	...	.0009	...	.0437
23	.0217	.0121	.0338	.0001	.0027	.0028	.0010	...	.0010	...	.0376
24	.0168	.0123	.0291	.0002	.0027	.0029	.0011	...	.0011	...	.0331
25	.0134	.0123	.0257	.0003	.0028	.0031	.0012	...	.0012	...	.0300
26	.0111	.0123	.0234	.0003	.0029	.0032	.0014	...	.0014	...	.0280
27	.0096	.0122	.0218	.0003	.0031	.0034	.0016	...	.0016	...	.0268
28	.0083	.0120	.0203	.0004	.0034	.0038	.0019	...	.0019	...	.0260
29	.0069	.0117	.0186	.0004	.0037	.0041	.0022	...	.0022	...	.0249
30	.0057	.0111	.0168	.0004	.0040	.0044	.0023	.0002	.0025	...	.0237
31	.0046	.0101	.0147	.0004	.0045	.0049	.0023	.0006	.0029	...	.0225
32	.0036	.0090	.0126	.0004	.0049	.0053	.0023	.0011	.0034	...	.0213
33	.0028	.0079	.0107	.0004	.0054	.0058	.0023	.0016	.0039	...	.0204
34	.0022	.0071	.0093	.0004	.0059	.0063	.0023	.0023	.0046	...	.0202
35	.0019	.0064	.0083	.0004	.0063	.0067	.0023	.0032	.0055	...	.0205
36	.0016	.0062	.0078	.0004	.0068	.0072	.0022	.0043	.0065	...	.0215
37	.0014	.0061	.0075	.0004	.0073	.0077	.0021	.0055	.0076	...	.0228
38	.0013	.0060	.0073	.0004	.0077	.0081	.0018	.0076	.0094	...	.0248
39	.0012	.0059	.0071	.0004	.0080	.0084	.0011	.0107	.0118	...	.0273
40	.0011	.0057	.0068	.0004	.0082	.0086	.0008	.0145	.0153	...	.0307
41	.0009	.0054	.0063	.0004	.0084	.0088	.0007	.0190	.0197	...	.0348
42	.0008	.0049	.0057	.0004	.0086	.0090	.0005	.0254	.0259	...	.0406
43	.0006	.0044	.0050	.0005	.0088	.0093	.0004	.0323	.0327	...	.0470
44	.0005	.0038	.0043	.0005	.0090	.0095	.0004	.0396	.0400	...	.0538
45	.0004	.0032	.0036	.0005	.0092	.0097	.0003	.0470	.04730606	
46	.0003	.0027	.0030	.0006	.0095	.0101	.0003	.0539	.05420673	

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RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

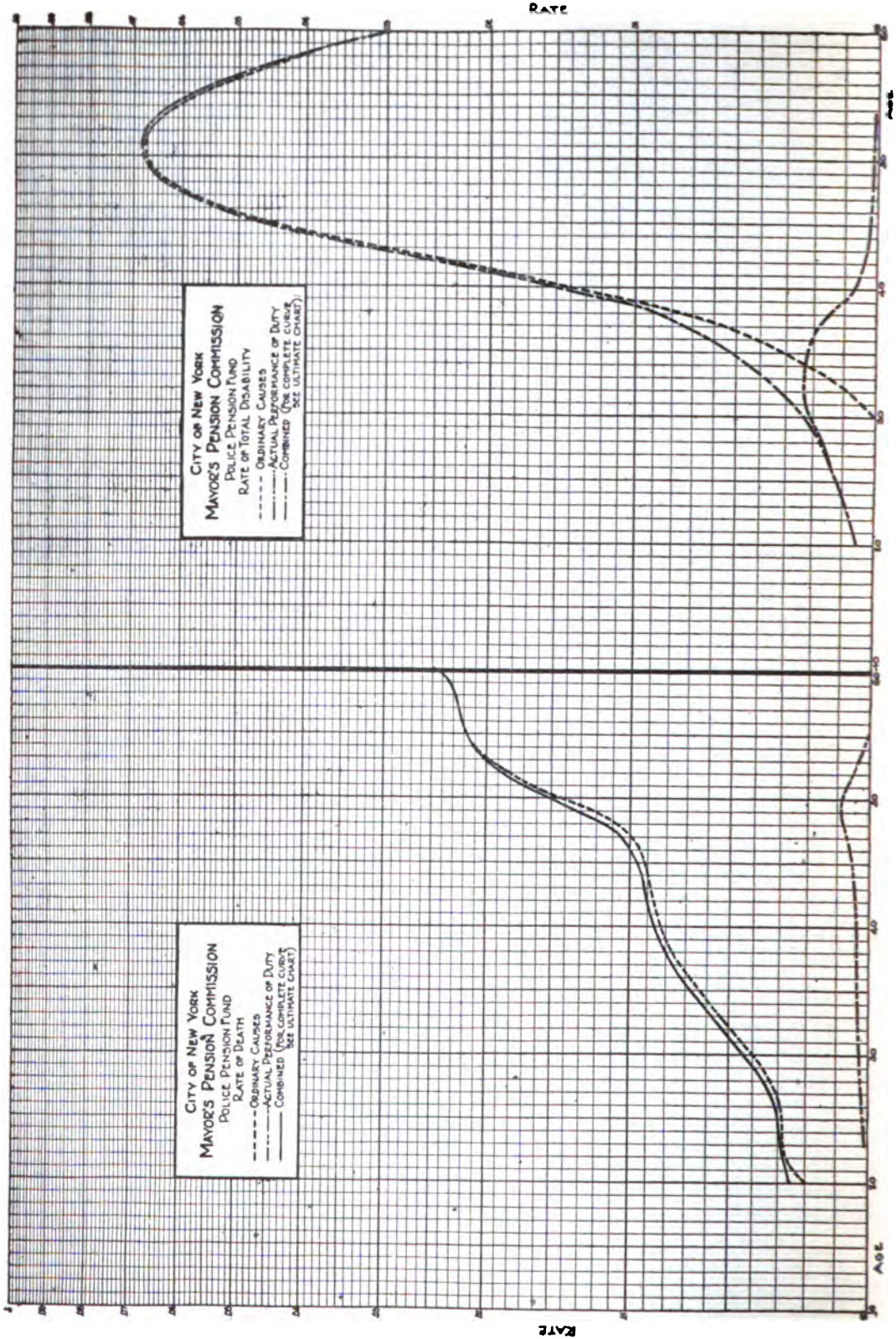
The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 47 and 48, showing the rates plotted on cross-section paper.

TABLE 12—RATES OF SEPARATION FROM ACTIVE SERVICE
Police Pension Fund

Age	Rate of Withdrawal			Rate of Death			Rate of Disability			Rate of Service Retirement	Total Rate of Separation
	Resignation	Dismissal	Total	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total		
										$rwq_x^{(a)}$		$dwq_x^{(a)}$	$wq_x^{(a)}$	$adq_x^{(a)}$	$odq_x^{(a)}$	$dq_x^{(a)}$	$atrq_x^{(a)}$	$otrq_x^{(a)}$	$trq_x^{(a)}$
20	.0450	.0113	.0563	...	.0026	.0026	.0006	...	.0006	...	.0595
21	.0360	.0116	.0476	...	.0026	.0026	.0007	...	.0007	...	.0509
22	.0281	.0119	.0400	.0001	.0027	.0028	.0009	...	.0009	...	.0437
23	.0217	.0121	.0338	.0001	.0027	.0028	.0010	...	.0010	...	.0376
24	.0168	.0123	.0291	.0002	.0027	.0029	.0011	...	.0011	...	.0331
25	.0134	.0123	.0257	.0003	.0028	.0031	.0012	...	.0012	...	.0300
26	.0111	.0123	.0234	.0003	.0029	.0032	.0014	...	.0014	...	.0280
27	.0096	.0122	.0218	.0003	.0031	.0034	.0016	...	.0016	...	.0268
28	.0083	.0120	.0203	.0004	.0034	.0038	.0019	...	.0019	...	.0260
29	.0069	.0117	.0186	.0004	.0037	.0041	.0022	...	.0022	...	.0249
30	.0057	.0111	.0168	.0004	.0040	.0044	.0023	.0002	.0025	...	.0237
31	.0046	.0101	.0147	.0004	.0045	.0049	.0023	.0006	.0029	...	.0225
32	.0036	.0090	.0126	.0004	.0049	.0053	.0023	.0011	.0034	...	.0213
33	.0028	.0079	.0107	.0004	.0054	.0058	.0023	.0016	.0039	...	.0204
34	.0022	.0071	.0093	.0004	.0059	.0063	.0023	.0023	.0046	...	.0202
35	.0019	.0064	.0083	.0004	.0063	.0067	.0023	.0032	.0055	...	.0205
36	.0016	.0062	.0078	.0004	.0068	.0072	.0022	.0043	.0065	...	.0215
37	.0014	.0061	.0075	.0004	.0073	.0077	.0021	.0055	.0076	...	.0228
38	.0013	.0060	.0073	.0004	.0077	.0081	.0018	.0076	.0094	...	.0248
39	.0012	.0059	.0071	.0004	.0080	.0084	.0011	.0107	.0118	...	.0273
40	.0011	.0057	.0068	.0004	.0082	.0086	.0008	.0145	.0153	...	.0307
41	.0009	.0054	.0063	.0004	.0084	.0088	.0007	.0190	.0197	...	.0348
42	.0008	.0049	.0057	.0004	.0086	.0090	.0005	.0254	.0259	...	.0406
43	.0006	.0044	.0050	.0005	.0088	.0093	.0004	.0323	.0327	...	.0470
44	.0005	.0038	.0043	.0005	.0090	.0095	.0004	.0396	.0400	...	.0538
45	.0004	.0032	.0036	.0005	.0092	.0097	.0003	.0470	.0473	...	.0606
46	.0003	.0027	.0030	.0006	.0095	.0101	.0003	.0539	.0542	...	.0673

SECTION II



RATES OF RESIGNATION AND DISMISSAL

The rate of resignation considered as a whole is lower in the Police Department than in any other department for which this rate was derived, except the Fire Department.

Dismissals outnumber resignations; in fact about 65 percent. of all withdrawals are dismissals. The dismissal rate, however, does not rank very high as compared with similar rates for other funds for which such a rate was derived; four departments had a higher rate, whereas only two, the Health and the Fire funds, had lower rates.

These two rates combined make up the rate of withdrawal which is the third from the lowest rate among the eleven shown. The only lower rates are those for the Supreme Court and the Fire Department, a fact apparently indicating that employment in the uniformed police force is attractive and, in view of the high retirement rates, that the force is depleted through retirement rather than by withdrawal.

RATE OF DEATH

The rates of death in the active service cover deaths occurring in performance of duty and those resulting from other causes.

The accidental death rate, which includes only those deaths in the actual performance of duty is lower for the police fund than for any of the other three funds for which such a rate was required. The deaths resulting directly from service in the Street Cleaning Department, the Fire Department and the Health Department are shown as higher. This rate, of course, does not reflect the total rate of accident in service, since it covers only fatalities. If the rate of death in the actual performance of duty be combined with the rate of disability in actual performance of duty it will be found that of the three departments—Police, Fire and Health—the Police have a rate higher than Firemen, but lower than employees of the Health Department.

Excepting the street cleaners, the rate of death from other causes among the police is the highest of such rates for the four departments mentioned above.

The total death rate in the active police service secured by combining the deaths in the performance of duty with other deaths stands fifth among the city funds; being exceeded by the rates for the Street Cleaning Department Relief Fund and for the three classes included in the Employees' Retirement Fund. The rate is, however, somewhat higher than rates prepared from the experience of the Royal Irish Constabulary Force, the only other police rate available.

RATE OF DISABILITY

The rate of disability in the actual performance of duty is higher in the Police Pension Fund than in the Health, Fire or Street Cleaning Departments' funds; the only others for which such a rate was developed. Although, taken as a whole, the rate in the police fund is the highest, yet age for age it is higher than the others only up to about age 37, while from about age 41 on it is lower than the other three.

The rate of disability from causes not arising in the actual performance of duty is also highest in the police fund, the rate for that fund being

about double the rate in the Street Cleaning Fund, which is the next highest. Such a difference is very great; in fact the rate is so high that it raises a doubt as to whether all cases of disability are the result of material health impairment. This conclusion may be drawn from the fact that in the period 1908 to 1913 disability retirements constituted nearly half of all separations from the service and were over three times more numerous than retirements on service pension. Over half this large number of disability retirements took place just after the employees had had twenty years of service and before they had had twenty-five years of service. Employees retiring on disability pension are given a discretionary amount within certain limitations. The pension allowable on disability after twenty years of service is as large as any which may be awarded; has a minimum limitation of one-half final salary, and is not revocable.

The total rate of disability, secured by combining the rates for the two classes of disability, is the highest of any shown in the city service, being very much higher than the next highest, that of the Street Cleaning Department.

RATE OF SERVICE RETIREMENT

The rate of service retirement, although apparently not as important as the disability retirement in the Police Pension Fund, is nevertheless the second highest among the rates for all funds. The rate is exceeded as a whole to age 65 by the rate for the Fire Department Relief Fund, since police are not eligible for retirement until age 55, while firemen may retire before that age.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

PENSIONERS

The table on page 51 shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross-section paper is given on page 52.

DISABILITY PENSIONERS' DEATH RATE

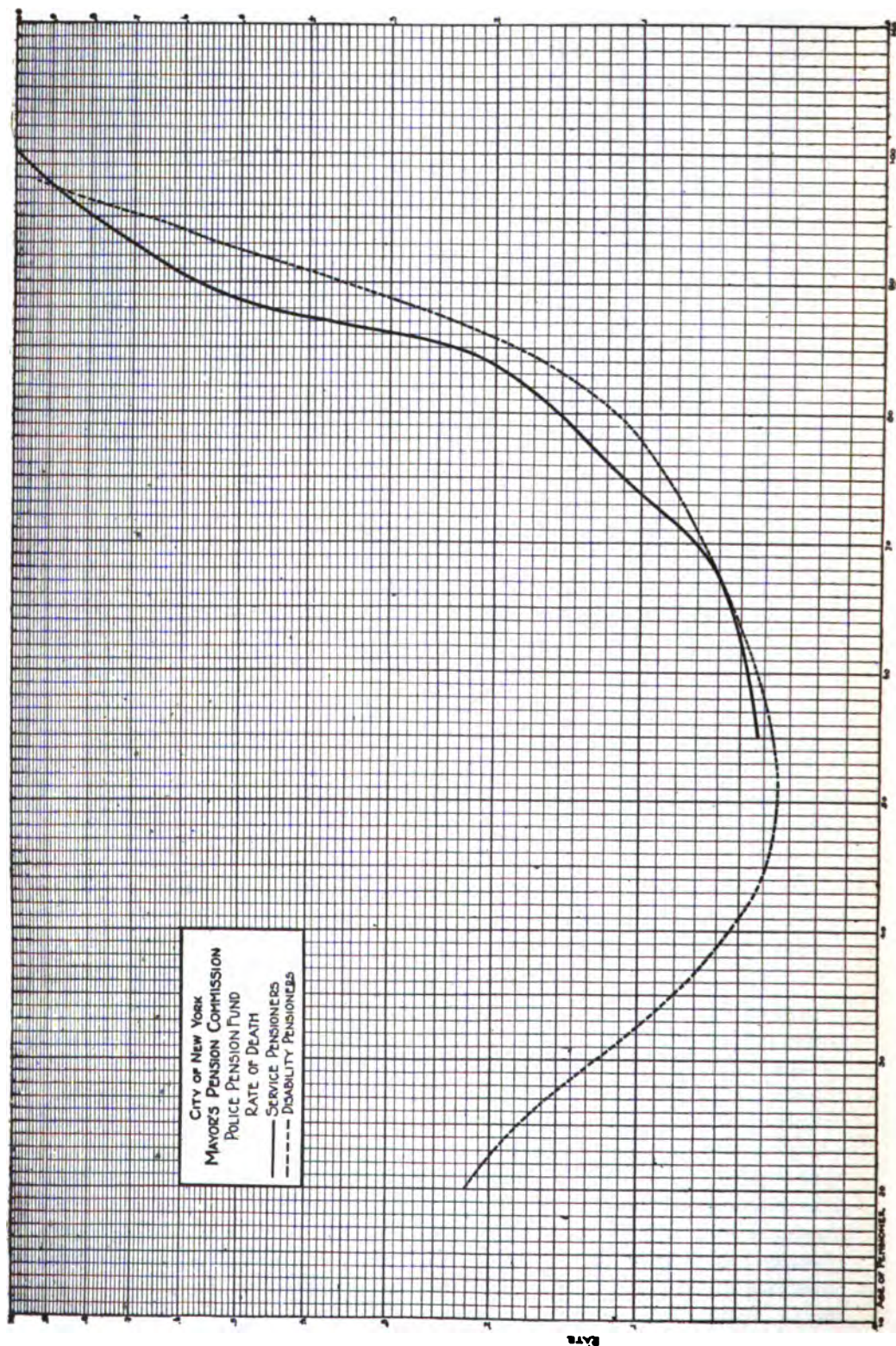
The application of the rate of death for disability pensioners of the 1913 report to the exposure prepared by the Commission gives over 7 per cent. more cases of death than the present experience shows; consequently it seemed advisable to graduate the rate on the basis of the present experience. The rate of mortality for disability pensioners is the lowest used, with the single exception of that applying to women teachers. The rate is noticeably lower than the general invalid mortality rates which were available for comparison from outside sources. When it is recalled that an extraordinary high rate of disability retirement from active service is coupled with this low death rate among disability pensioners there seems to be an indication that many of the employees were retired for slight impairments of health which did not seriously affect their constitutions.

TABLE 13—RATES OF MORTALITY AMONG PENSIONERS—
POLICE PENSION FUND

Age	Disability	Service	Age	Disability	Service
20	.2210	...	60	.0435	.0470
21	.2140	...	61	.0453	.0480
22	.2060	...	62	.0471	.0492
23	.1980	...	63	.0492	.0508
24	.1885	...	64	.0514	.0525
25	.1790	...	65	.0538	.0544
26	.1687	...	66	.0562	.0563
27	.1573	...	67	.0589	.0592
28	.1452	...	68	.0618	.0626
29	.1341	...	69	.0646	.0664
30	.1239	...	70	.0675	.0712
31	.1140	...	71	.0710	.0777
32	.1050	...	72	.0742	.0850
33	.0967	...	73	.0780	.0936
34	.0890	...	74	.0819	.1025
35	.0818	...	75	.0860	.1108
36	.0753	...	76	.0908	.1188
37	.0695	...	77	.0955	.1260
38	.0642	...	78	.1014	.1340
39	.0592	...	79	.1079	.1425
40	.0547	...	80	.1153	.1520
41	.0506	...	81	.1245	.1624
42	.0472	...	82	.1354	.1745
43	.0441	...	83	.1495	.1900
44	.0418	...	84	.1655	.2100
45	.0398	...	85	.1850	.2400
46	.0382	...	86	.2100	.2925
47	.0370	...	87	.2380	.3700
48	.0362	...	88	.2740	.4650
49	.0357	...	89	.3135	.5280
50	.0353	...	90	.3575	.5760
51	.0352	...	91	.4100	.6230
52	.0353	...	92	.4650	.6650
53	.0358	...	93	.5300	.7070
54	.0362	...	94	.6050	.7500
55	.0369	.0429	95	.6850	.7930
56	.0379	.0436	96	.7700	.8350
57	.0390	.0444	97	.8630	.8800
58	.0402	.0452	98	.9600	.9240
59	.0419	.0461	..	...	...

SERVICE PENSIONERS' DEATH RATE

The number of deaths among service pensioners, according to the present experience, is about 8 per cent. less than the number obtained by multiplying the rates shown in the 1913 report into the present exposure, consequently a new rate was graduated. The rate for police is the second highest of the nine service pensioners' mortality rates used, being exceeded only by the rate for street cleaners. The rate is higher than the corresponding rate for firemen. Although many of the policemen may take advantage of disability retirement when their health is not seriously impaired, the rate of mortality among service pensioners seems to indicate that the policemen who remain in the service long enough to retire on service pensions have really had their health somewhat impaired by service as they do not live as long as their comrades who claim to have suffered disabilities.



SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above:

TABLE 14—ACTIVE SERVICE TABLE AND SALARY SCALE

Police Pension Fund

Age	Living $l_x^{(a)}$	WITHDRAWALS			DEATHS			SEPARATIONS BY DISABILITY			Service Retirements $e_r^{(a)}$	Total Decrement	Salary Scale s_x
		Resignations $r_x^{(a)}$ w_x	Dismissals $d_x^{(a)}$ w_x	Total $w_x^{(a)}$	In Performance of Duty $e_d^{(a)}$ z	Other Causes $e_{d-x}^{(a)}$	Total $d_x^{(a)}$	In Performance of Duty $e_t^{(a)}$ r_x	Other Causes $e_t^{(a)}$ r_x	Total $t_x^{(a)}$ r_x			
20	100,000	4,502	1,133	5,635	..	260	260	61	...	61	...	5,956	780
21	94,044	3,384	1,090	4,474	..	247	247	67	...	67	...	4,788	814
22	89,256	2,508	1,062	3,570	7	237	244	76	...	76	...	3,890	850
23	85,366	1,851	1,031	2,882	12	230	242	82	...	82	...	3,206	891
24	82,160	1,380	1,010	2,390	17	225	242	90	...	90	...	2,722	936
25	79,438	1,065	978	2,043	20	225	245	99	...	99	...	2,387	984
26	77,051	856	948	1,804	23	227	250	109	...	109	...	2,103	1,037
27	74,888	717	912	1,629	25	234	259	118	...	118	...	2,006	1,091
28	72,882	604	874	1,478	26	246	272	135	...	135	...	1,885	1,145
29	70,997	489	832	1,321	26	260	286	153	...	153	...	1,760	1,198
30	69,237	394	766	1,160	26	279	305	156	16	172	...	1,637	1,248
31	67,600	308	684	992	26	301	327	156	40	196	...	1,515	1,296
32	66,085	237	594	831	26	323	349	154	71	225	...	1,405	1,339
33	64,680	180	514	694	26	346	372	151	104	255	...	1,321	1,377
34	63,359	142	449	591	25	371	396	148	146	294	...	1,281	1,411
35	62,078	116	401	517	25	394	419	141	198	339	...	1,275	1,439
36	60,863	97	374	471	25	414	439	133	261	394	...	1,304	1,464
37	59,499	85	360	445	24	433	457	122	332	454	...	1,356	1,484
38	58,143	74	349	423	24	445	469	103	443	546	...	1,438	1,502
39	56,705	66	334	400	24	451	475	61	611	672	...	1,547	1,518
40	55,158	58	314	372	23	452	475	46	795	841	...	1,688	1,533
41	53,470	48	288	336	23	449	472	35	1,021	1,056	...	1,864	1,547
42	51,606	39	253	292	23	444	467	27	1,309	1,336	...	2,095	1,558
43	49,511	31	216	247	23	435	458	22	1,595	1,617	...	2,322	1,568
44	47,189	24	178	202	23	424	447	18	1,867	1,885	...	2,534	1,577
45	44,655	18	142	160	24	411	435	14	2,098	2,112	...	2,707	1,584
46	41,948	13	113	126	27	398	425	12	2,260	2,272	...	2,823	1,591
47	39,125	11	88	99	30	386	416	10	2,320	2,330	...	2,845	1,597
48	36,280	7	72	79	30	394	424	8	2,314	2,322	...	2,825	1,604
49	33,455	6	59	65	28	418	446	6	2,232	2,238	...	2,749	1,612

TABLE 15—DISABILITY PENSIONERS' MORTALITY TABLE

Police Pension Fund

Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$	Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$
20	100,000	22,100	59	2,473	104
21	77,900	16,671	60	2,369	103
22	61,229	12,613	61	2,266	103
23	48,616	9,626	62	2,163	101
24	38,990	7,350	63	2,062	102
25	31,640	5,663	64	1,960	101
26	25,977	4,382	65	1,859	100
27	21,595	3,397	66	1,759	99
28	18,198	2,643	67	1,660	97
29	15,555	2,086	68	1,563	97
30	13,469	1,669	69	1,466	95
31	11,800	1,345	70	1,371	92
32	10,455	1,097	71	1,279	91
33	9,358	905	72	1,188	88
34	8,453	753	73	1,100	86
35	7,700	630	74	1,014	83
36	7,070	532	75	931	80
37	6,538	454	76	851	77
38	6,084	391	77	774	74
39	5,693	337	78	700	71
40	5,356	293	79	629	68
41	5,063	256	80	561	65
42	4,807	227	81	496	61
43	4,580	202	82	435	59
44	4,378	183	83	376	56
45	4,195	167	84	320	53
46	4,028	154	85	267	50
47	3,874	143	86	217	45
48	3,731	135	87	172	41
49	3,596	129	88	131	36
50	3,467	122	89	95	30
51	3,345	118	90	65	23
52	3,227	114	91	42	17
53	3,113	111	92	25	12
54	3,002	109	93	13	7
55	2,893	107	94	6	4
56	2,786	105	95	2	1
57	2,681	105	96	1	1
58	2,576	103	..	...	...

TABLE 16—SERVICE PENSIONERS' MORTALITY TABLE**Police Pension Fund**

Age	Living $l^{(p)}_x$	Dying $d^{(p)}_x$	Age	Living $l^{(p)}_x$	Dying $d^{(p)}_x$
55	289,322	12,412	76	74,493	8,850
56	276,910	12,073	77	65,643	8,271
57	264,837	11,759	78	57,372	7,688
58	253,078	11,439	79	49,684	7,080
59	241,639	11,140	80	42,604	6,476
60	230,499	10,833	81	36,128	5,867
61	219,666	10,544	82	30,261	5,281
62	209,122	10,289	83	24,980	4,746
63	198,833	10,101	84	20,234	4,249
64	188,732	9,908	85	15,985	3,836
65	178,824	9,728	86	12,149	3,554
66	169,096	9,520	87	8,595	3,180
67	159,576	9,447	88	5,415	2,518
68	150,129	9,398	89	2,897	1,530
69	140,731	9,345	90	1,367	787
70	131,386	9,355	91	580	361
71	122,031	9,482	92	219	146
72	112,549	9,567	93	73	52
73	102,982	9,639	94	21	16
74	93,343	9,568	95	5	4
75	83,775	9,282	96	1	1

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 41. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary:

TABLE 17—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS, PAYABLE TO THESE MEMBERS AND THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1,000 FOR VALUES DETERMINED BY SALARY AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Police Pension Fund

AGE AT ENTRANCE	*Total Future Salary	Total of All Pension Benefits	PENSIONS TO MEMBERS					PENSIONS TO WIDOWS					PENSIONS TO CHILDREN					Pensions to Dependent Parents of Members Dying in Performance of Duty
			Total	Upon Service Retire- ment	UPON DISABILITY			Total	OF MEMBERS DYING IN SERVICE		Of Members Dying While on Pension	Total	OF MEMBERS DYING IN SERVICE		Of Members Dying While on Pension			
					Total	In Performance of Duty	Ordinary Causes After First 10 Years Service		Total	While in Performance of Duty			From Ordinary Causes	Total		While in Performance of Duty	From Ordinary Causes	
20	\$19,233	2,046	\$1,600	\$303	\$82	\$1,215	\$424	\$18	\$170	\$236	\$19	\$1	\$10	\$8	\$3			
25	17,930	2,524	1,912	368	91	1,453	583	27	209	347	24	1	11	12	5			
30	14,470	2,643	1,954	405	77	1,472	663	31	206	426	23	1	9	13	3			
35	11,560	2,424	1,773	477	46	1,250	629	30	178	421	19	1	7	11	3			
40	9,134	1,861	1,347	612	15	720	499	27	142	330	13	1	5	7	2			

* Total Future Salary Estimated without use of $\frac{1}{2}$ column, which was used to obtain cost of Service Pension only.

The following table shows the expectations of life of pensioners of various ages, together with the annuity values based on the mortality tables, which were used in valuing pensions:

TABLE 18—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

Police Pension Fund

AGE	ANNUITY VALUE		EXPECTATION OF LIFE		AGE	ANNUITY VALUE		EXPECTATION OF LIFE	
	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners		Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners
20	4.26	...	5.82	...	59	9.62	9.22	13.52	12.67
21	4.52	...	6.33	...	60	9.40	9.01	13.09	12.25
22	4.82	...	6.91	...	61	9.18	8.79	12.66	11.83
23	5.15	...	7.57	...	62	8.95	8.55	12.24	11.41
24	5.53	...	8.32	...	63	8.73	8.31	11.82	10.97
25	5.95	...	9.14	...	64	8.50	8.06	11.40	10.53
26	6.41	...	10.02	...	65	8.27	7.80	10.99	10.09
27	6.89	...	10.95	...	66	8.04	7.52	10.59	9.64
28	7.38	...	11.90	...	67	7.81	7.24	10.19	9.18
29	7.88	...	12.84	...	68	7.58	6.95	9.80	8.73
30	8.36	...	13.75	...	69	7.34	6.66	9.41	8.28
31	8.83	...	14.63	...	70	7.11	6.36	9.02	7.83
32	9.28	...	15.45	...	71	6.87	6.06	8.64	7.39
33	9.70	...	16.20	...	72	6.63	5.77	8.26	6.98
34	10.09	...	16.88	...	73	6.39	5.49	7.88	6.58
35	10.45	...	17.48	...	74	6.14	5.23	7.51	6.20
36	10.77	...	17.99	...	75	5.89	4.98	7.13	5.86
37	11.05	...	18.42	...	76	5.64	4.74	6.76	5.52
38	11.29	...	18.75	...	77	5.37	4.50	6.38	5.20
39	11.49	...	19.01	...	78	5.10	4.26	6.00	4.88
40	11.65	...	19.17	...	79	4.83	4.01	5.63	4.56
41	11.77	...	19.25	...	80	4.55	3.76	5.25	4.23
42	11.84	...	19.25	...	81	4.26	3.50	4.86	3.90
43	11.88	...	19.18	...	82	3.96	3.23	4.48	3.56
44	11.88	...	19.04	...	83	3.66	2.93	4.11	3.20
45	11.85	...	18.85	...	84	3.37	2.63	3.74	2.84
46	11.79	...	18.61	...	85	3.08	2.30	3.39	2.46
47	11.71	...	18.33	...	86	2.79	1.96	3.04	2.08
48	11.61	...	18.02	...	87	2.51	1.65	2.72	1.73
49	11.49	...	17.67	...	88	2.25	1.39	2.41	1.45
50	11.35	...	17.31	...	89	2.00	1.24	2.13	1.28
51	11.20	...	16.92	...	90	1.77	1.12	1.87	1.16
52	11.03	...	16.52	...	91	1.56	1.02	1.64	1.05
53	10.85	...	16.11	...	92	1.37	.93	1.43	.96
54	10.67	...	15.69	...	93	1.19	.85	1.23	.87
55	10.47	9.99	15.26	14.24	94	1.02	.76	1.05	.79
56	10.27	9.81	14.83	13.86	95	.87	.67	.89	.70
57	10.06	9.62	14.39	13.47	96	.75	...	.76	...
58	9.84	9.43	13.95	13.07	97	.60	...	.61	...

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 19—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Police Pension Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
22	45	\$45,000	10,783	\$15,169,590	49	140	\$227,950	1,364	\$2,292,830
23	96	96,000	10,738	15,124,590	50	158	274,900	1,224	2,064,880
24	245	244,900	10,642	15,028,590	51	167	276,050	1,066	1,789,980
25	328	328,370	10,397	14,783,690	52	169	284,850	899	1,513,930
26	306	306,150	10,069	14,455,320	53	150	248,600	730	1,229,080
27	267	270,100	9,763	14,149,170	54	161	266,190	580	980,480
28	422	488,040	9,496	13,879,070	55	127	217,900	419	714,290
29	537	656,610	9,074	13,391,030	56	91	152,200	292	496,390
30	650	837,960	8,537	12,734,420	57	49	82,150	201	344,190
31	565	729,490	7,887	11,896,460	58	29	49,100	152	262,040
32	526	690,150	7,322	11,166,970	59	25	45,500	123	212,940
33	481	655,230	6,796	10,476,820	60	26	43,200	98	167,440
34	502	705,230	6,315	9,821,590	61	20	37,500	72	124,240
35	474	673,300	5,813	9,116,360	62	11	18,400	52	86,740
36	478	678,500	5,339	8,443,060	63	7	12,140	41	68,340
37	425	612,100	4,861	7,764,560	64	7	14,950	34	56,200
38	375	543,520	4,436	7,152,460	65	6	8,450	27	41,250
39	360	537,170	4,061	6,608,940	66	4	7,700	21	32,800
40	346	537,020	3,701	6,071,770	67	6	9,700	17	25,100
41	280	443,270	3,355	5,534,750	68	2	2,800	11	15,400
42	294	466,420	3,075	5,091,480	69	3	4,200	9	12,600
43	236	383,580	2,781	4,625,060	70	1	1,400	6	8,400
44	262	428,750	2,545	4,241,480	71	3	4,200	5	7,000
45	247	406,800	2,283	3,812,730	72	1	1,400	2	2,800
46	265	431,450	2,036	3,405,930	73	...	...	1	1,400
47	245	415,700	1,771	2,974,480	74	1	1,400	1	1,400
48	162	265,950	1,526	2,558,780					

TABLE 20—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE.

Police Pension Fund

Total Service — Yrs.	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Yrs.	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	123	\$123,950	10,783	\$15,169,590	16	24	\$39,500	3,038	\$5,129,620
1	1,013	1,014,030	10,660	15,045,640	17	366	596,120	3,014	5,090,120
2	625	627,200	9,647	14,031,610	18	765	1,296,170	2,648	4,494,000
3	526	565,590	9,022	13,404,410	19	269	453,250	1,883	3,197,830
4	333	403,670	8,496	12,838,820	20	185	289,850	1,614	2,744,580
5	524	725,100	8,163	12,435,150	21	294	477,450	1,429	2,454,730
6	757	1,060,950	7,639	11,710,050	22	166	260,000	1,135	1,977,280
7	901	1,280,370	6,882	10,649,100	23	133	225,200	969	1,717,280
8	350	492,650	5,981	9,368,730	24	142	235,700	836	1,492,080
9	758	1,076,000	5,631	8,876,080	25	136	230,400	694	1,256,380
10	294	414,000	4,873	7,800,080	26	140	248,340	558	1,025,980
11	678	982,920	4,579	7,386,080	27	87	154,990	418	777,640
12	357	525,420	3,901	6,403,160	28	115	215,200	331	622,050
13	291	432,470	3,544	5,877,740	29	37	77,550	216	407,450
14	130	194,650	3,253	5,445,270	30				
15	85	121,000	3,123	5,250,620	& over	179	329,900	179	329,900

TABLE 21—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE**Police Pension Fund**

Age	Number	Pensions	Age	Number	Pensions
25	1	\$400	59	50	\$38,190
26	...	...	60	39	28,750
27	...	...	61	33	24,250
28	2	930	62	32	24,460
29	4	1,670	63	25	17,750
30	4	2,030	64	24	18,990
31	3	810	65	17	13,110
32	5	2,360	66	20	15,010
33	6	2,820	67	19	13,960
34	3	1,400	68	18	14,340
35	4	2,100	69	16	12,940
36	11	4,540	70	14	10,680
37	9	5,120	71	4	2,650
38	11	4,450	72	5	3,400
39	18	9,370	73	6	3,600
40	26	13,720	74	4	3,380
41	22	13,770	75	7	7,230
42	27	14,250	76	6	4,150
43	25	16,150	77	3	2,400
44	47	28,340	78	2	800
45	41	28,290	79	2	1,880
46	51	33,190	80	...	...
47	84	58,000	81	...	...
48	83	59,300	82	3	1,700
49	63	46,080	83	1	250
50	82	59,190	84	...	...
51	101	75,300	85	2	900
52	144	108,660	86	...	...
53	131	94,860	87	1	1,380
54	127	95,780	88	1	1
55	123	95,480	89	1	1,000
56	106	78,750	90	...	...
57	82	58,690			
58	64	50,810	Total	1,865	\$1,333,761

TABLE 22—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE**Police Pension Fund**

Age	Number	Pensions	Age	Number	Pensions
55	8	\$6,030	75	23	\$18,180
56	32	25,660	76	14	10,490
57	38	29,230	77	11	9,040
58	38	32,420	78	10	6,500
59	21	18,080	79	7	4,450
60	32	30,130	80	7	4,700
61	29	24,330	81	6	4,280
62	22	17,820	82	5	4,900
63	25	18,930	83	1	600
64	37	30,730	84	4	2,800
65	43	34,510	85	4	3,150
66	43	36,540	86	...	...
67	60	47,240	87	1	600
68	69	53,080	88	1	600
69	61	47,080	89	..	...
70	60	44,430	90	..	...
71	48	38,050	91	..	...
72	41	30,590	92	..	...
73	27	23,990			
74	23	17,840	Totals	851	\$677,000

TABLE 23—NUMBER AND PENSIONS OF ALL WIDOW PENSIONERS* CLASSIFIED BY AGE

Police Pension Fund

Age	Number	Pensions	Age	Number	Pensions
25	1	\$600	63	38	\$11,940
26	..	...	64	31	9,120
27	1	600	65	35	10,390
28	1	600	66	31	9,250
29	3	1,200	67	28	8,120
30	5	1,500	68	31	9,300
31	2	900	69	30	9,000
32	10	3,600	70	31	9,750
33	14	4,260	71	19	5,550
34	11	3,300	72	28	8,400
35	12	3,600	73	16	4,740
36	15	4,380	74	24	7,020
37	21	6,240	75	12	3,600
38	15	4,350	76	13	3,580
39	28	8,700	77	4	1,200
40	25	7,740	78	10	3,000
41	24	6,900	79	9	2,730
42	30	8,760	80	6	1,800
43	27	8,580	81	2	600
44	33	10,600	82	5	1,680
45	51	15,600	83	5	1,500
46	45	14,100	84	3	900
47	41	11,880	85	5	1,320
48	48	13,620	86	..	...
49	39	11,520	87	1	300
50	45	13,500	88	1	300
51	47	14,100	89	1	300
52	47	14,700	90	2	600
53	40	12,480	91	..	...
54	55	16,320	92	..	...
55	34	10,200	93	..	...
56	41	11,880	94	..	...
57	32	9,800	95	..	...
58	30	8,880	96	..	...
59	36	10,800	97	..	...
60	40	11,700	98	..	...
61	46	13,520	99	1	120
62	25	7,500			
Total...				1,442	\$434,620

*Includes one dependent parent pensioner.

TABLE 24—NUMBER AND PENSIONS OF ALL CHILDREN PENSIONERS CLASSIFIED BY AGE

Police Pension Fund

Age	Number	Pensions	Age	Number	Pensions
1	..	...	11	13	\$1,300
2	..	...	12	14	1,950
3	..	...	13	10	990
4	1	\$150	14	11	1,190
5	2	420	15	14	2,770
6	4	430	16	16	1,500
7	2	150	17	12	1,270
8	4	510	18	10	1,140
9	5	440			
10	6	620	Total...	124	\$14,830

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets the complete financial condition of the fund as of that date:

TABLE 25—A VALUATION OF ASSETS AND LIABILITIES OF

LIABILITIES		
Item		Present Value of Payments to be Made
Pensions to 4,282 Pensioners now on the pension roll of the fund as follows:		
Service Pensioners:		
851 annual pensions aggregating.....	\$677,000	\$4,884,437
Disability Pensioners:		
1,865 annual pensions aggregating.....	1,333,761	13,900,739
Widow Pensioners:		
1,441 annual pensions aggregating.....	434,020	4,956,274
Children Pensioners:		
124 annual pensions aggregating.....	14,830	62,303
Dependent Parent Pensioners:		
1 annual pension aggregating.....	600	2,856
Total Pensions Entered Upon.....		\$23,806,609
Pensions to Dependents of present pensioners:		
Widows' Pensions:		
Widows of Service Pensioners.....		\$906,897
Widows of Disability Pensioners.....		2,530,131
Children's Pensions:		
Children of Service Pensioners.....		8,430
Children of Disability Pensioners.....		68,068
Total Prospective Pensions to Dependents of Present Pensioners.....		\$3,513,526
Pensions to such Employees as will retire from the present active force of 10,783 employees:		
Service Pensions.....		\$12,585,190
Disability Pensions:		
In Actual Performance of Duty.....		586,831
Due to Other Causes after 10 years service.....		27,034,263
Total Prospective Pensions to Employees.....		\$40,206,284
Pensions to Dependents of such employees of the present active force as will die in service, or while on pension:		
Widows' Pensions:		
Widows of employees who will die in Performance of Duty...		\$273,941
Widows of employees who will die from Other Causes in service.....		3,472,341
Widows of employees who will die as Service Pensioners..		1,936,905
Widows of employees who will die as Disability Pensioners.		4,680,111
Children's Pensions:		
Children of employees who will die in Performance of Duty		9,735
Children of employees who will die from Other Causes in service.....		158,015
Children of employees who will die as Service Pensioners..		33,303
Children of employees who will die as Disability Pensioners		148,573
Dependent Parents' Pensions:		
Parents of employees who will die in Performance of Duty		27,072
Total Prospective Pensions to Dependents of employees in service.....		\$10,739,996
Total Pensions Not Entered Upon.....		\$54,459,806
Grand Total.....		\$78,266,415

and liabilities of the Police Pension Fund as of June 30, 1914, and shows

THE POLICE PENSION FUND—VALUED AS OF JUNE 30, 1914

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand.....	\$936,650
Contribution of Two Percentum of Future Salaries by Employees.....	3,206,594
*Deficiency.....	74,123,171
Grand Total.....	\$78,266,415

*NOTE—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$6,413,200.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners:

TABLE 26—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Police Pension Fund

Years After Valuation	*Date	Regular or Service Pensions	Disability Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total	Years After Valuation	*Date	Regular or Service Pensions	Disability Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
0	1914	\$651,491	\$1,303,624	\$427,390	\$14,235	\$566	\$2,397,300	37	1951	\$8	\$43,072	\$35,707	...	...	\$78,787
1	1915	605,038	1,247,594	412,659	12,358	490	2,278,139	38	1952	2	34,698	31,619	...	...	66,319
2	1916	559,999	1,193,038	398,052	10,831	426	2,102,946	39	1953	...	27,079	27,858	...	...	55,537
3	1917	516,040	1,141,418	383,542	8,060	366	2,049,426	40	1954	...	21,871	24,445	...	...	46,316
4	1918	473,576	1,090,884	369,135	6,360	311	1,940,266	41	1955	...	17,136	21,324	...	...	38,460
5	1919	432,059	1,041,344	354,823	5,837	202	1,834,925	42	1956	...	13,313	18,506	...	...	31,819
6	1920	393,363	993,064	340,633	5,390	218	1,731,208	43	1957	...	10,260	15,959	...	...	26,219
7	1921	355,840	945,791	326,551	2,647	178	1,631,007	44	1958	...	7,848	13,689	...	...	21,537
8	1922	320,223	899,535	311,669	2,035	143	1,533,605	45	1959	...	5,959	11,668	...	...	17,627
9	1923	286,647	853,957	298,944	1,602	114	1,441,264	46	1960	...	4,893	9,889	...	...	14,782
10	1924	255,158	808,310	286,407	1,105	88	1,331,068	47	1961	...	3,365	8,325	...	...	11,690
11	1925	225,728	752,433	272,050	957	66	1,204,016	48	1962	...	2,502	6,957	...	...	9,459
12	1926	198,332	723,433	258,900	542	46	1,180,253	49	1963	...	1,851	5,772	...	...	7,623
13	1927	172,901	698,455	245,984	142	29	1,117,571	50	1964	...	1,354	4,755	...	...	6,109
14	1928	149,611	639,298	233,312	...	15	1,022,236	51	1965	...	987	3,887	...	...	4,874
15	1929	109,060	599,115	220,911	...	6	920,101	52	1966	...	715	3,148	...	...	3,863
16	1930	93,005	559,972	208,782	...	2	801,761	53	1967	...	516	2,526	...	...	3,042
17	1931	79,148	522,441	196,933	...	...	708,522	54	1968	...	371	2,012	...	...	2,383
18	1932	66,918	484,065	185,379	...	...	737,262	55	1969	...	266	1,586	...	...	1,852
19	1933	56,159	449,213	174,151	...	...	679,523	56	1970	...	189	1,234	...	...	1,423
20	1934	46,097	414,044	163,252	...	...	624,863	57	1971	...	125	951	...	...	1,076
21	1935	38,895	381,447	152,690	...	...	572,942	58	1972	...	92	724	...	...	816
22	1936	31,619	349,519	142,481	...	...	523,019	59	1973	...	63	541	...	...	604
23	1937	25,366	318,977	132,644	...	...	476,987	60	1974	...	41	399	...	...	440
24	1938	20,040	280,824	123,180	...	...	433,044	61	1975	...	26	290	...	...	316
25	1939	15,597	265,069	114,089	...	...	391,745	62	1976	...	16	204	...	...	220
26	1940	11,992	235,745	105,399	...	...	353,046	63	1977	...	8	137	...	...	145
27	1941	8,852	187,354	89,207	...	...	316,801	64	1978	...	3	90	...	...	93
28	1942	6,337	154,354	89,207	...	...	282,898	65	1979	...	1	59	...	...	60
29	1943	4,393	105,299	81,707	...	...	251,309	66	1980	...	...	37	...	...	37
30	1944	2,748	144,682	74,612	...	...	222,042	67	1981	...	...	23	...	...	23
31	1945	1,631	125,547	67,836	...	...	195,014	68	1982	...	...	14	...	...	14
32	1946	881	107,903	61,579	...	...	170,363	69	1983	...	...	7	...	...	7
33	1947	488	91,801	55,652	...	...	147,881	70	1984	...	...	4	...	...	4
34	1948	188	76,659	50,098	...	...	126,945	71	1985	...	...	2	...	...	2
35	1949	75	64,289	44,932	...	...	109,206	72	1986	...	...	1	...	...	1
36	1950	27	53,014	40,143	...	...	93,184	Total	.....	\$6,216,731	\$20,630,905	\$7,757,170	\$70,641	\$3,320	\$34,686,957

*Date year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund, expressed as a percentage of the employees' salary:

TABLE 27—THE RATES OF CONTRIBUTION, EXPRESSED AS PERCENTAGES OF SALARIES, NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE POLICE PENSION FUND

AGE AT ENTRANCE	Total	PENSION TO EMPLOYEES					PENSION TO WIDOWS OF				PENSION TO CHILDREN OF				
		Total (1)+(2)+(3)	Service Pension (1)	DISABILITY PENSION			Total (4)+(5)+(6)	ACTIVES DYING		Pension- ers Dying (6)	Total (7)+(8)+(9)	ACTIVES DYING		Pension- ers Dying (9)	Pension to Dependent Parents Total (10)
				Total (2)+(3)	In Per- formance of Duty No Limi- tation (2)	Other Causes After 10 Years (3)		In Per- formance of Duty (4)	Not in Performance of Duty After 10 Years (5)			In Per- formance of Duty (7)	Not in Performance of Duty After 10 Years (8)		
20	10.71	8.32	1.57	6.75	.43	6.32	2.27	.10	.91	1.26	.10	.01	.05	.04	.02
21	11.34	8.76	1.66	7.10	.45	6.65	2.45	.11	.96	1.38	.11	.01	.05	.05	.02
22	11.99	9.21	1.75	7.46	.46	7.00	2.65	.12	1.02	1.51	.11	.01	.05	.05	.02
23	12.68	9.67	1.84	7.83	.48	7.35	2.86	.13	1.08	1.65	.13	.01	.06	.06	.02
24	13.41	10.15	1.94	8.21	.49	7.72	3.10	.14	1.14	1.82	.13	.01	.06	.06	.03
25	14.17	10.66	2.05	8.61	.51	8.10	3.35	.16	1.20	1.99	.13	.01	.06	.06	.03
26	14.99	11.20	2.18	9.02	.52	8.50	3.62	.17	1.26	2.19	.14	.01	.06	.07	.03
27	15.83	11.75	2.30	9.45	.53	8.92	3.90	.19	1.32	2.39	.15	.01	.06	.08	.03
28	16.71	12.34	2.45	9.89	.54	9.35	4.19	.20	1.38	2.61	.16	.01	.07	.08	.02
29	17.60	12.94	2.62	10.32	.54	9.78	4.47	.21	1.43	2.83	.17	.01	.07	.09	.02
30	18.44	13.51	2.80	10.71	.53	10.18	4.74	.22	1.47	3.05	.17	.01	.07	.09	.02
31	19.25	14.05	3.00	11.05	.52	10.53	5.01	.24	1.51	3.26	.17	.01	.07	.09	.02
32	19.97	14.54	3.23	11.31	.50	10.81	5.23	.24	1.54	3.45	.18	.01	.07	.10	.02
33	20.55	14.92	3.49	11.43	.47	10.96	5.43	.25	1.57	3.61	.18	.01	.07	.10	.02
34	20.98	15.20	3.79	11.41	.44	10.97	5.58	.26	1.59	3.73	.18	.01	.07	.10	.02
35	21.22	15.34	4.12	11.22	.40	10.82	5.68	.27	1.60	3.81	.18	.01	.07	.10	.02
36	21.23	15.29	4.44	10.85	.36	10.49	5.75	.28	1.62	3.85	.17	.01	.06	.10	.02
37	20.98	15.01	4.71	10.30	.30	10.00	5.77	.29	1.63	3.85	.17	.01	.06	.10	.03
38	20.56	14.59	4.95	9.94	.25	9.39	5.78	.29	1.65	3.84	.16	.01	.06	.09	.03
39	19.99	14.02	5.16	8.86	.19	8.67	5.78	.30	1.66	3.82	.16	.01	.06	.09	.03
40	19.34	13.38	5.34	8.04	.16	7.88	5.78	.31	1.65	3.82	.15	.01	.06	.08	.03

Contributions**By EMPLOYEES**

No contribution.

By CITY***Indirect Contributions:***

Miscellaneous revenues, such as disciplinary and absence deductions from pay of uniformed force; proceeds of sales of departmental property; certain proportions of penalties; license fees; excise moneys; fines; and 45 per cent of tax collected from foreign fire insurance companies on business done in the City of New York.

Direct Contributions:

Certificates of indebtedness to supplement other revenues as required to meet maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in the actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305, of this report.

BASIC DATA AND THEIR DEVELOPMENT**Schedules included**

The schedules for employees in the Fire Department were divided into two classes; one including the schedules representing the uniformed force, which is covered by the relief fund; the other including the schedules representing the clerical staff, which is covered by the City of New York Employees' Retirement Fund. The former class only is considered in this section of the report. The schedules for the latter class were further subdivided and included under the various divisions of City of New York Employees' Retirement Fund.

Special methods of handling data

The general methods previously outlined were employed in developing the data to show unadjusted rates and in graduating the unadjusted rates. The extent of the experience is shown in the following tables:

**TABLE 28—SUMMARY OF EXPOSURE AND SEPARATIONS—
ACTIVE SERVICE****Fire Department Relief Fund**

Number Exposed to Risk.....	27,210.5
Total Number of Separations.....	933
Total Withdrawals.....	223
Resignations.....	95
Dismissals.....	128
Total Deaths.....	161
In Performance of Duty.....	30
Other Causes.....	131
Total Separations by Disability.....	195
In Performance of Duty.....	15
Other Causes.....	180
Total Service Retirements.....	354

TABLE 29—SUMMARY OF EXPOSURE—SALARY.**Fire Department Relief Fund.**

Class	Number of Annual Salaries	Total Payroll
Active Members.....	21,304	\$32,204,870
Pensioned Members.....	817	1,477,390
Total.....	22,121	\$33,682,260

**TABLE 30—SUMMARY OF EXPOSURE AND SEPARATIONS—
EMPLOYEE PENSIONERS.****Fire Department Relief Fund.**

Class	Exposed to Risk	Deaths
Disability Pensioners.....	1,420	113
Service Pensioners.....	2,859	122
Total.....	4,279	235

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 72 and 73 showing the rates plotted on cross-section paper.

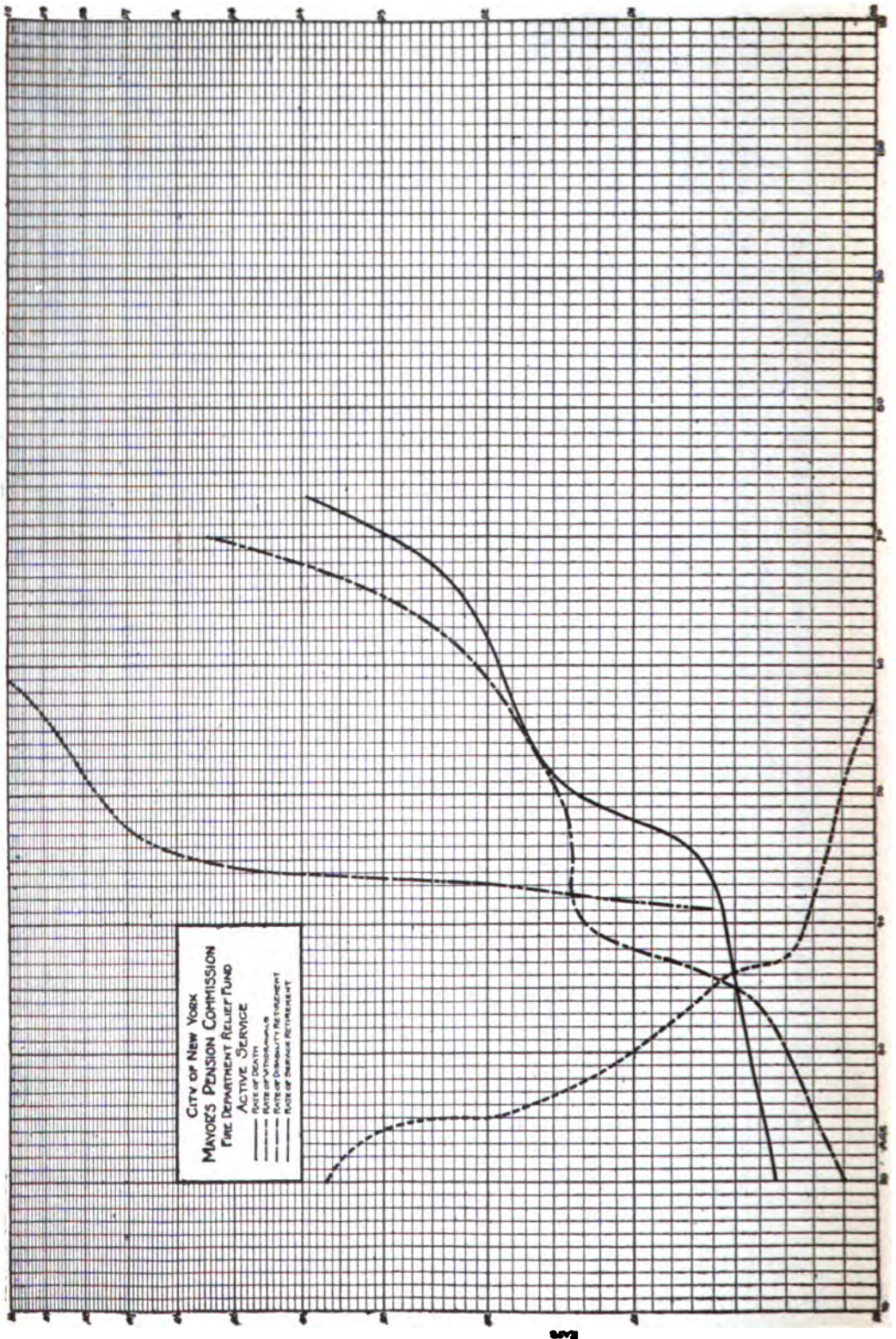
TABLE 31—RATES OF SEPARATION FROM ACTIVE SERVICE

Fire Department Relief Fund

AGE	RATE OF WITHDRAWAL			RATE OF DEATH			RATE OF DISABILITY			Rate of Service Retirement	Total Rate of Separation
	Resignation $r_w q_x^{(a)}$	Dismissal $d_w q_x^{(a)}$	Total $w q_x^{(a)}$	In Performance of Duty $a_d q_x^{(a)}$	Other Causes $o_d q_x^{(a)}$	Total $d q_x^{(a)}$	In Performance Of Duty $a_r q_x^{(a)}$	Other Causes $o_r q_x^{(a)}$	Total $t_r q_x^{(a)}$		
20	.0296	.0074	.0370	.0001	.0033	.0034	...	.0011	.0011	...	.0415
21	.0289	.0073	.0362	.0002	.0033	.0035	...	.0013	.0013	...	.0410
22	.0273	.0073	.0346	.0003	.0033	.0036	...	.0015	.0015	...	.0397
23	.0257	.0073	.0330	.0004	.0033	.0037	...	.0016	.0016	...	.0383
24	.0232	.0072	.0304	.0005	.0033	.0038	...	.0018	.0018	...	.0360
25	.0130	.0072	.0202	.0006	.0034	.0040	.0001	.0019	.0020	...	.0262
26	.0101	.0071	.0172	.0007	.0034	.0041	.0001	.0021	.0022	...	.0235
27	.0076	.0070	.0146	.0009	.0034	.0043	.0002	.0023	.0025	...	.0214
28	.0058	.0069	.0127	.0010	.0034	.0044	.0002	.0024	.0026	...	.0197
29	.0045	.0069	.0114	.0011	.0034	.0045	.0002	.0026	.0028	...	.0187
30	.0036	.0067	.0103	.0012	.0034	.0046	.0002	.0028	.0030	...	.0179
31	.0028	.0065	.0093	.0012	.0034	.0046	.0002	.0030	.0032	...	.0171
32	.0022	.0063	.0085	.0012	.0035	.0047	.0003	.0032	.0035	...	.0167
33	.0017	.0060	.0077	.0013	.0036	.0049	.0004	.0035	.0039	...	.0165
34	.0014	.0056	.0070	.0013	.0036	.0049	.0007	.0037	.0044	...	.0163
35	.0011	.0052	.0063	.0013	.0037	.0050	.0009	.0044	.0053	...	.0160
36	.0009	.0045	.0054	.0013	.0038	.0051	.0010	.0054	.0064	...	.0169
37	.0007	.0026	.0033	.0014	.0038	.0052	.0011	.0071	.0082	...	.0167
38	.0006	.0023	.0029	.0014	.0040	.0054	.0011	.0094	.0105	...	.0188
39	.0004	.0022	.0026	.0014	.0041	.0055	.0011	.0108	.0119	...	.0200
40	.0003	.0021	.0024	.0014	.0042	.0056	.0011	.0119	.0130	...	.0210
41	.0002	.0020	.0022	.0014	.0043	.0057	.0011	.0124	.0135	.0058	.0272
42	.0001	.0019	.0020	.0014	.0045	.0059	.0011	.0128	.0139	.0129	.0347
43	.0001	.0018	.0019	.0013	.0048	.0061	.0010	.0130	.0140	.0299	.0519
44	.0001	.0017	.0018	.0013	.0050	.0063	.0008	.0131	.0139	.0464	.0684
45	...	.0017	.0017	.0012	.0054	.0066	.0005	.0133	.0138	.0564	.0785
46	...	.0016	.0016	.0012	.0061	.0073	.0004	.0134	.0138	.0640	.0867

TABLE 31—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Fire Department Relief Fund

AGE	RATE OF WITHDRAWAL			RATE OF DEATH			RATE OF DISABILITY			Rate of Service Retirement ${}_w q_x^{(s)}$	Total Rate of Separation
	Resignation $r w q_x^{(s)}$	Dismissal $d w q_x^{(s)}$	Total $w q_x^{(s)}$	In Performance of Duty $d q_x^{(s)}$	Other Causes $e d q_x^{(s)}$	Total $d q_x^{(s)}$	In Performance Of Duty $s r q_x^{(s)}$	Other Causes $e r q_x^{(s)}$	Total $r q_x^{(s)}$		
470015	.0015	.0012	.0072	.0084	.0003	.0136	.0139	.0690	.0928
480014	.0014	.0011	.0091	.0102	.0003	.0138	.0141	.0720	.0977
490013	.0013	.0010	.0111	.0121	.0002	.0142	.0144	.0743	.1021
500012	.0012	.0009	.0127	.0136	.0002	.0146	.0148	.0768	.1064
510010	.0010	.0007	.0140	.0147	.0002	.0150	.0152	.0788	.1097
520009	.0009	.0006	.0149	.0155	.0001	.0156	.0157	.0808	.1129
530007	.0007	.0004	.0157	.0161	.0001	.0162	.0163	.0828	.1195
540004	.0004	.0002	.0164	.0166	.0001	.0167	.0168	.0850	.1188
550003	.0003	.0001	.0170	.0171	.0001	.0173	.0174	.0872	.1220
560002	.0002	...	.0176	.0176	...	.0179	.0179	.0898	.1255
570001	.0001	...	.0180	.0180	...	.0185	.0185	.0930	.1296
580001	.0001	...	.0184	.0184	...	.0193	.0193	.0965	.1343
590001	.0001	...	.0188	.0188	...	.0201	.0201	.1008	.1398
600192	.0192	...	.0212	.0212	.1060	.1464
610197	.0197	...	.0222	.0222	.1123	.1542
620201	.0201	...	.0235	.0235	.1210	.1646
630206	.0206	...	.0250	.0250	.1318	.1774
640214	.0214	...	.0270	.0270	.1450	.1934
650219	.0219	...	.0296	.0296	.1613	.2128
660229	.0229	...	.0326	.0326	.1820	.2375
670239	.0239	...	.0364	.0364	.2060	.2663
680254	.0254	...	.0412	.0412	.2400	.3066
690274	.0274	...	.0474	.0474	.2930	.3678
700295	.0295	...	.0547	.0547	.3500	.4342
710320	.0320	...	...	...	.4500	.4820
720351	.0351	...	...	...	.7500	.7851
730395	.0395	...	...	...	.9605	1.0000



Rate

Age

CITY OF NEW YORK
MAYOR'S PENSION COMMISSION
FIRE DEPARTMENT RELIEF FUND
RATE OF TOTAL DISABILITY
----- ORDINARY CAUSES
----- ACTUAL PERFORMANCE OF DUTY
----- COMBINED (SEE ULTIMATE CHART)

CITY OF NEW YORK
MAYOR'S PENSION COMMISSION
FIRE DEPARTMENT RELIEF FUND
RATE OF DEATH
----- ORDINARY CAUSES
----- ACTUAL PERFORMANCE OF DUTY
----- COMBINED (SEE ULTIMATE CHART)

Rate

Age

RATES OF RESIGNATION AND DISMISSAL

The rate of resignation for the Fire Department as a whole is the lowest among corresponding rates in the city service, the next higher rate is that applying to policemen.

The rate of dismissal taken as a whole is the lowest of all such rates in the city service.

The total rate of withdrawal, made up of the rates of resignation and dismissal combined, is the lowest of all such rates, being even lower than those for the Supreme Court Pension Funds, the Police Pension Fund and the Teachers' Retirement Fund. That the rate for firemen is low is probably the result of the fact that in this department withdrawal from the service with a pension because of disability is permitted earlier in life and after fewer years of service than is common in the city service. In departments where the limitations upon disability retirement are more stringent, withdrawals from service at the earlier ages occasioned by disability necessarily take the form of resignations without pension. Although the rate of withdrawal in the Fire Department Relief Fund is lower than the corresponding rate in the Police Pension Fund, it resembles the rate of that department more closely in its general tendency to decrease than the rate of any other department.

RATE OF DEATH

Two rates of death were required for valuation purposes in the Fire Department, one covering deaths in the actual performance of duty and the other covering deaths from other causes.

The rate of death from actual performance of duty, taken as a whole, is the highest recorded for any of the three departments for which such a rate was derived from actual experience, but lower than that adopted for valuing pensions under the Street Cleaning Relief and Pension Fund. Approximately 14 per cent. of all deaths in the active service of the Fire Department are the result of the actual performance of duty.

The rate of death from causes not connected with the actual performance of duty is the lowest shown by any of the four Departments for which such rates were prepared. A low rate of death from causes not connected with the actual performance of duty is doubtless to be expected because a select group of men is considered whose physical fitness for service has been determined by examination at entrance. Furthermore, the experience reveals a comparatively high rate of disability and of death after retirement because of disability, apparently indicating that the weaker lives, which would have supplied deaths in the active service, under a fund not permitting disability retirements so freely, have, in the case of the Fire Department Relief Fund, withdrawn from the active service as disability pensioners so that their deaths became those of disability pensioners.

The rate of death in the actual performance of duty and the rate of death from other causes form a comparatively light total death rate in active service, the rate ranking about seventh out of eleven such rates for the city service. The only rates which are lower are those for the members of the Supreme Court funds and of the teaching profession. A similar rate of mortality derived from the experience of the Boston Fire Depart-

ment, which was used for comparison, is somewhat lower up to about age 35, where it exceeds the rate of the New York department on account of a higher rate of death in performance of duty. The data which were employed as a basis for the Boston rate, however, were considered as only indicative of that experience, so that the results of the comparisons can hardly be taken as definitely showing an actual difference in this respect; however, the second set of rates corroborates the first.

RATE OF DISABILITY

The rate of disability in performance of duty for the Fire Department ranks third among the four rates prepared covering disability from service causes. The rate is lower than that for policemen or for employees in the Health Department.

The rate of disability from causes other than performance of duty is also third out of four departments for which such rates were computed; the only rate shown as being lower is that for the Health Department.

When the rates for the two classes of disability are combined in a single disability rate, comparison becomes possible with similar rates from eleven other funds. The rate for the uniformed force of the Fire Department then appears very high; higher, in fact, than that for any other fund except those of the Police Department and the Street Cleaning Department. Such a high rate of retirement through disability is doubtless the result of the accident hazard of the fireman's occupation and the provisions of the law permitting retirement because of disability regardless of the shortness of the time the employee may have been in the service. The rate for the Fire Department Relief Fund follows closely the corresponding rate for the Police Pension Fund to about age 38. From ages 40 to 50 the rate shows little increase, a condition which is perhaps the natural result of a large number of service retirements that are made during these ages.

RATE OF SERVICE RETIREMENT

The rate of service retirement for the Fire Department, considered as a whole up to age 65, is the highest of all rates of service retirement applying to the departments of city service. It is peculiarly high from ages 41 to 50. During that period the average uniformed employee of the department completes the required twenty years' service and, as no age limitation is placed upon retirement and as the amount of pension does not necessarily increase with increasing length of service, the average employee, perhaps naturally avails himself immediately of the privilege of taking his pension and adopting a less hazardous occupation. Considering the rates of disability along with the rates of service retirement, we find that the retirement rates of the Fire Department are higher than those of any other department with the single exception of the Police Department.

RATE OF SALARY CHANGE

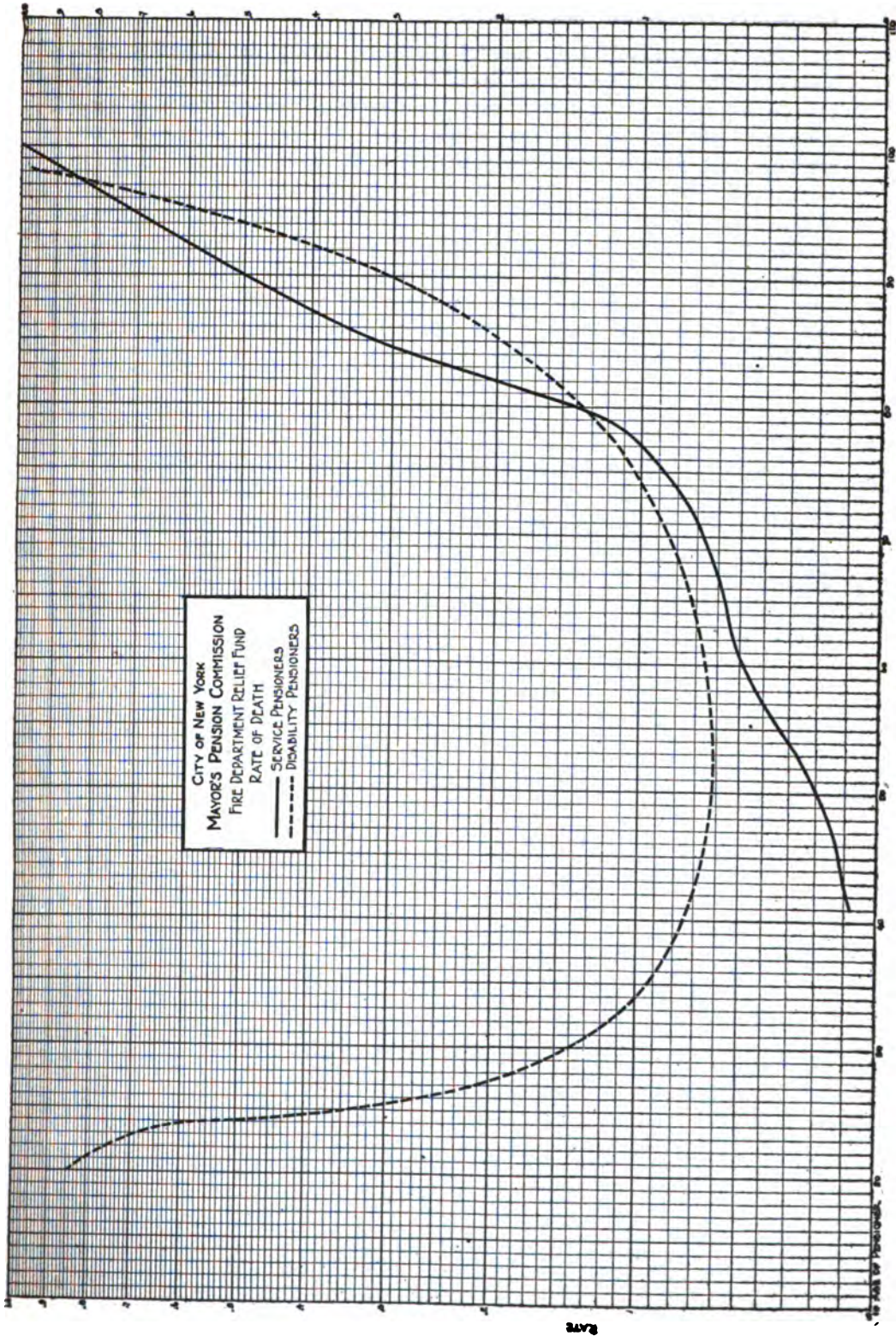
The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

The following table shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross-section paper is given on page 77:

TABLE 32—RATES OF MORTALITY AMONG PENSIONERS**Fire Department Relief Fund**

Age	Disability	Service	Age	Disability	Service
20	.4578	...	61	.0671	.0510
21	.4485	...	62	.0685	.0530
22	.4338	...	63	.0700	.0545
23	.4150	...	64	.0713	.0560
24	.3995	...	65	.0730	.0575
25	.3475	...	66	.0750	.0590
26	.2750	...	67	.0772	.0610
27	.2200	...	68	.0795	.0630
28	.1850	...	69	.0820	.0653
29	.1600	...	70	.0850	.0678
30	.1417	...	71	.0882	.0710
31	.1278	...	72	.0920	.0742
32	.1175	...	73	.0960	.0780
33	.1090	...	74	.1000	.0824
34	.1015	...	75	.1050	.0877
35	.0952	...	76	.1105	.0940
36	.0900	...	77	.1163	.1020
37	.0858	...	78	.1230	.1120
38	.0820	...	79	.1300	.1250
39	.0788	...	80	.1382	.1460
40	.0758	...	81	.1480	.1740
41	.0734	.0087	82	.1580	.2070
42	.0712	.0096	83	.1690	.2430
43	.0692	.0104	84	.1815	.2800
44	.0677	.0112	85	.1960	.3220
45	.0662	.0123	86	.2120	.3590
46	.0650	.0136	87	.2310	.3940
47	.0640	.0149	88	.2530	.4300
48	.0632	.0163	89	.2770	.4650
49	.0628	.0180	90	.3075	.5020
50	.0622	.0200	91	.3475	.5410
51	.0620	.0223	92	.3925	.5830
52	.0618	.0248	93	.4450	.6250
53	.0618	.0273	94	.5025	.6700
54	.0619	.0302	95	.5800	.7160
55	.0622	.0335	96	.6750	.7680
56	.0627	.0370	97	.7700	.8200
57	.0634	.0402	98	.9750	.8750
58	.0640	.0437	99	1.0000	.9350
59	.0650	.0464	100	...	1.0000
60	.0660	.0488	..	...	...



DISABILITY PENSIONERS' DEATH RATE

The comparatively high rate of mortality among the disability pensioners of the Fire Department Relief Fund offsets the comparatively low rate of mortality in the active force. Those who become disability pensioners in the first ten years of service are probably, as a general rule, actually disabled and consequently have a high mortality rate. Had the experience been larger it would have been advisable to derive rates for groups classified according to the duration of the disability. A comparison of the rates of mortality of pensioners retired from the different branches of the city service because of disability shows that the rate for the Fire Department is the highest of all from the outset to age 28, and that from that age to about age 70 it is exceeded only by the rates for the Street Cleaning Department and the Supreme Court.

SERVICE PENSIONERS' DEATH RATE

The mortality rate of service pensioners of the Fire Department Relief Fund is similar to the corresponding rate for like classes of risks. The service pensioners of the Police Department probably represent about the same type of men, and the rate of mortality applying to them follows closely the one obtaining in the Fire Department. The rate as a whole is somewhat lower than the rate for policemen; it is, however, the third highest rate among the nine rates used.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above:

TABLE 33—ACTIVE SERVICE TABLE AND SALARY SCALE

Fire Department Relief Fund

AGE	Living l_x^a	WITHDRAWALS			DEATHS			SEPARATIONS BY DISABILITY			Service Retirements $o_r(a)$ $\%$	Total Decrement	Salary Scale s_s
		Resignations $r_w(a)$ $\%$	Dismissals $d_w(a)$ $\%$	Total $w(a)$ $\%$	In Performance of Duty $o_d(a)$ $\%$	Other Causes $o_d'(a)$ $\%$	Total $d(a)$ $\%$	In Performance of Duty $o_r(a)$ $\%$	Other Causes $o_r'(a)$ $\%$	Total $r(a)$ $\%$			
20	1,000,000	29,600	7,378	36,978	82	3,338	3,420	...	1,060	1,060	...	41,458	929
21	958,542	27,664	7,045	34,709	172	3,201	3,373	...	1,108	1,108	...	39,280	931
22	919,262	25,096	6,724	31,820	264	3,072	3,336	...	1,333	1,333	...	36,489	942
23	882,773	22,687	6,422	29,109	298	2,952	3,250	...	1,430	1,430	...	33,789	974
24	848,084	19,694	6,142	25,836	427	2,841	3,268	...	1,511	1,511	...	30,615	1,030
25	818,369	16,638	5,872	22,510	525	2,740	3,265	59	1,612	1,671	...	21,446	1,105
26	796,923	13,009	5,662	18,671	596	2,671	3,267	111	1,681	1,792	...	18,730	1,164
27	778,193	10,387	5,474	15,861	673	2,610	3,283	139	1,774	1,913	...	16,531	1,230
28	761,662	8,387	5,290	13,677	746	2,559	3,305	148	1,851	1,999	...	14,981	1,270
29	746,081	6,639	5,107	11,746	799	2,530	3,329	152	1,949	2,101	...	13,920	1,310
30	732,761	5,029	4,900	9,929	835	2,506	3,341	159	2,066	2,225	...	13,114	1,344
31	719,647	3,556	4,678	8,234	864	2,481	3,345	171	2,166	2,337	...	12,389	1,374
32	707,258	2,196	4,420	6,616	884	2,468	3,352	201	2,277	2,478	...	11,806	1,401
33	695,452	1,196	4,133	5,329	897	2,481	3,378	282	2,406	2,688	...	11,395	1,427
34	684,057	951	3,803	4,754	903	2,476	3,379	505	2,538	3,043	...	11,176	1,462
35	672,881	740	3,498	4,238	904	2,481	3,385	625	2,947	3,572	...	11,195	1,493
36	661,686	589	3,004	3,593	900	2,500	3,400	676	3,573	4,249	...	11,242	1,533
37	650,444	455	2,674	3,129	892	2,517	3,429	704	4,005	5,309	...	10,847	1,577
38	639,597	345	2,493	2,838	883	2,539	3,422	715	5,980	6,695	...	11,955	1,623
39	627,642	251	2,362	2,613	866	2,567	3,433	711	6,766	7,477	...	12,523	1,654
40	615,119	185	2,170	2,355	846	2,580	3,426	697	7,308	8,005	...	12,886	1,708
41	602,233	132	1,987	2,119	819	2,608	3,427	671	7,485	8,156	...	16,395	1,745
42	585,838	81	1,800	1,881	789	2,638	3,427	627	7,487	8,114	...	20,279	1,779
43	565,559	45	1,616	1,661	747	2,680	3,427	553	7,346	7,899	...	29,297	1,812
44	536,262	26	918	944	691	2,688	3,379	418	7,047	7,465	...	36,670	1,840
45	499,592	15	814	829	624	2,696	3,320	254	6,639	6,893	...	39,219	1,870
46	460,373	9	713	722	555	2,814	3,369	182	6,187	6,369	...	39,924	1,895

SECTION II

TABLE 33—ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

Fire Department Relief Fund

Age	Living $f(a)$	WITHDRAWALS			DEATHS			SEPARATIONS BY DISABILITY			Service Retirements $e_r(a)$	Total Decrement	Salary Scale s_a
		Resignations $r_w(a)$	Dismissals $d_w(a)$	Total $w(a)$	In Performance of Duty $a_d(a)$	Other Causes $e_d(a)$	Total $d(a)$	In Performance of Duty $a_l(a)$	Other Causes $e_l(a)$	Total $l(a)$			
47	420,449	...	614	614	484	3,034	3,518	135	5,714	5,849	29,011	38,902	1,920
48	381,457	...	524	524	414	3,477	3,891	104	5,272	5,376	27,465	37,256	1,945
49	344,201	...	442	442	338	3,820	4,158	79	4,870	4,949	25,574	35,123	1,962
50	309,078	...	366	366	263	3,934	4,197	59	4,506	4,565	23,737	32,805	1,980
51	276,213	...	268	268	199	3,866	4,065	43	4,157	4,200	21,766	30,299	1,995
52	245,914	...	228	228	142	3,671	3,813	32	3,832	3,864	19,870	27,775	2,001
53	218,139	...	156	156	89	3,424	3,513	23	3,526	3,549	18,062	25,280	2,033
54	192,859	...	85	85	48	3,155	3,203	15	3,225	3,240	16,393	22,921	2,040
55	169,938	...	56	56	16	2,888	2,904	11	2,938	2,949	14,818	20,717	2,045
56	149,211	...	32	32	...	2,623	2,623	7	2,671	2,678	13,399	18,732	2,050
57	130,479	...	19	19	...	2,348	2,348	5	2,414	2,419	12,135	16,921	2,055
58	113,558	...	11	11	...	2,089	2,089	2	2,189	2,191	10,958	15,249	2,059
59	98,309	...	6	6	...	1,848	1,848	1	1,977	1,978	9,909	13,741	2,063
60	84,568	...	2	2	...	1,627	1,627	...	1,789	1,789	8,964	12,382	2,065
61	72,186	...	...	...	...	1,418	1,418	...	1,602	1,602	8,107	11,117	2,065
62	61,059	...	...	...	...	1,228	1,228	...	1,432	1,432	7,388	10,048	2,065
63	51,011	...	...	...	...	1,051	1,051	...	1,275	1,275	6,722	9,048	2,065
64	41,963	...	...	...	...	896	896	...	1,133	1,133	6,084	8,113	2,065
65	33,850	...	...	...	...	741	741	...	1,000	1,000	5,460	7,201	2,065
66	26,649	...	...	...	...	609	609	...	868	868	4,851	6,328	2,065
67	20,321	...	...	...	...	486	486	...	740	740	4,186	5,412	2,066
68	14,900	...	...	...	...	379	379	...	614	614	3,578	4,571	2,068
69	10,338	...	...	...	...	283	283	...	490	490	3,029	3,802	2,070
70	6,536	...	...	...	...	193	193	...	357	357	2,287	2,837	2,075
71	3,699	...	...	...	...	119	119	...	...	...	1,664	1,783	2,080
72	1,916	...	...	...	...	68	68	...	...	...	1,437	1,505	2,085
73	411	...	...	...	...	17	17	...	...	...	394	411	2,090

TABLE 34—DISABILITY PENSIONERS' MORTALITY TABLE

Fire Department Relief Fund

Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$	Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$
20	2,000,000	915,600	59	2,803	182
21	1,084,400	486,353	60	2,621	173
22	598,047	259,403	61	2,448	165
23	338,644	140,537	62	2,283	156
24	198,107	79,144	63	2,127	149
25	118,963	41,400	64	1,978	141
26	77,563	21,330	65	1,837	134
27	56,233	12,371	66	1,703	128
28	43,862	8,114	67	1,575	122
29	35,748	5,720	68	1,453	116
30	30,028	4,255	69	1,337	109
31	25,773	3,294	70	1,228	104
32	22,479	2,641	71	1,124	99
33	19,838	2,162	72	1,025	95
34	17,676	1,795	73	930	89
35	15,881	1,511	74	841	84
36	14,370	1,294	75	757	79
37	13,076	1,122	76	678	75
38	11,954	980	77	603	70
39	10,974	864	78	533	66
40	10,110	766	79	467	59
41	9,344	686	80	408	58
42	8,658	617	81	350	52
43	8,041	556	82	298	47
44	7,485	507	83	251	42
45	6,978	462	84	209	38
46	6,516	423	85	171	34
47	6,093	390	86	137	29
48	5,703	360	87	108	25
49	5,343	336	88	83	21
50	5,007	311	89	62	17
51	4,696	292	90	45	14
52	4,404	272	91	31	11
53	4,132	255	92	20	8
54	3,877	240	93	12	5
55	3,637	226	94	7	4
56	3,411	214	95	3	2
57	3,197	203	96	1	1
58	2,994	191	..	...	...

TABLE 35—SERVICE PENSIONERS' MORTALITY TABLE

Fire Department Relief Fund

Age	Living (<i>l</i> _{<i>x</i>})	Dying (<i>d</i> _{<i>x</i>})	Age	Living (<i>l</i> _{<i>x</i>})	Dying (<i>d</i> _{<i>x</i>})
41	9,344	82	68	3,797	239
42	9,262	88	69	3,558	232
43	9,174	96	70	3,326	226
44	9,078	102	71	3,100	220
45	8,976	112	72	2,880	214
46	8,864	119	73	2,666	208
47	8,745	130	74	2,458	203
48	8,615	140	75	2,255	198
49	8,475	153	76	2,057	193
50	8,322	166	77	1,864	190
51	8,156	182	78	1,674	187
52	7,974	198	79	1,487	186
53	7,776	212	80	1,301	190
54	7,564	229	81	1,111	193
55	7,335	245	82	918	190
56	7,090	263	83	728	177
57	6,827	273	84	551	154
58	6,554	288	85	397	128
59	6,266	290	86	269	97
60	5,976	292	87	172	68
61	5,684	290	88	104	45
62	5,394	285	89	59	27
63	5,109	278	90	32	16
64	4,831	271	91	16	9
65	4,560	262	92	7	4
66	4,298	254	93	3	2
67	4,044	247	94	1	1

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 66. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 36—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS PAYABLE TO THESE MEMBERS AND THEIR FAMILIES BASED ON AN ENTRANCE SALARY OF \$1,000, FOR VALUES DETERMINED BY SALARY AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY.

Fire Department Relief Fund

AGE AT ENTRANCE	*Total Future Salary	Total of All Pension Benefits	PENSIONS TO MEMBERS				PENSIONS TO WIDOWS				PENSIONS TO CHILDREN				PENSIONS TO DEPENDENT PARENTS				
			Total	Upon Service Retire- ment	Upon Disability			Total	Of Members Dying in Service			Total	Of Members Dying in Service		Total	Of Members Dying in Service	Pensions to Dependent Parents		
					In Per- formance of Duty	From Ordinary Causes			Total	While in Per- formance of Duty	From Ordinary Causes		Of Members Dying in Service	Of Members Dying While on Pension					
						During First 10 Years Service	After First 10 Years Service											While in Per- formance of Duty	From Ordinary Causes
20	\$49,115	\$2,734	\$2,118	\$1,607	\$511	\$34	\$22	\$455	\$548	\$89	\$155	\$304	\$80	\$6	\$11	\$13	\$38	\$8	\$30
25	18,501	3,462	2,597	1,983	614	42	55	517	782	128	214	440	42	8	15	19	41	10	31
30	15,320	3,610	2,582	1,963	619	44	123	452	954	142	244	565	48	9	16	23	29	8	21
35	12,811	3,582	2,434	1,824	610	45	250	315	1,076	126	254	606	48	7	15	26	24	6	18
40	9,499	3,267	2,042	1,535	507	27	295	185	1,157	91	253	813	46	5	13	28	22	5	17

*Total future salary estimated without use of $0\frac{1}{2}$ column, which was used to obtain cost of service pension only.

The following table shows the expectations of life of pensioners of various ages, together with the annuity values based on the mortality tables, which were used in valuing pensions.

**TABLE 37—ANNUITY VALUES AND EXPECTATIONS OF LIFE
APPLICABLE TO DISABILITY AND SERVICE PENSIONERS**

Fire Department Relief Fund

AGE	ANNUITY VALUE		EXPECTATION OF LIFE		AGE	ANNUITY VALUE		EXPECTATION OF LIFE	
	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners		Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners
20	1.73	...	1.94	...	58	8.33	9.44	11.37	13.16
21	1.88	...	2.15	...	59	8.19	9.23	11.11	12.74
22	2.09	...	2.50	...	60	8.06	9.02	10.85	12.33
23	2.43	...	3.02	...	61	7.91	8.81	10.58	11.94
24	2.92	...	3.81	...	62	7.77	8.61	10.31	11.56
25	3.70	...	5.02	...	63	7.61	8.40	10.03	11.17
26	4.60	...	6.43	...	64	7.46	8.19	9.75	10.79
27	5.38	...	7.68	...	65	7.34	7.98	9.45	10.40
28	6.01	...	8.71	...	66	7.12	7.75	9.16	10.00
29	6.53	...	9.57	...	67	6.92	7.51	8.86	9.60
30	6.97	...	10.30	...	68	6.76	7.27	8.57	9.19
31	7.34	...	10.91	...	69	6.58	7.01	8.27	8.77
32	7.66	...	11.44	...	70	6.37	6.74	7.95	8.35
33	7.93	...	11.90	...	71	6.17	6.47	7.64	7.92
34	8.18	...	12.29	...	72	5.98	6.18	7.33	7.49
35	8.39	...	12.62	...	73	5.77	5.88	7.03	7.05
36	8.56	...	12.90	...	74	5.56	5.57	6.72	6.60
37	8.72	...	13.13	...	75	5.36	5.25	6.41	6.15
38	8.85	...	13.31	...	76	5.13	4.91	6.10	5.70
39	8.96	...	13.46	...	77	4.92	4.56	5.80	5.24
40	9.05	...	13.56	...	78	4.68	4.21	5.50	4.77
41	9.12	14.55	13.63	24.23	79	4.47	3.84	5.20	4.31
42	9.17	14.24	13.67	23.44	80	4.23	3.47	4.88	3.86
43	9.21	13.93	13.68	22.66	81	4.03	3.11	4.61	3.43
44	9.23	13.61	13.66	21.90	82	3.83	2.79	4.33	3.05
45	9.24	13.29	13.62	21.14	83	3.58	2.50	4.04	2.71
46	9.24	12.97	13.55	20.40	84	3.38	2.25	3.75	2.42
47	9.22	12.65	13.46	19.67	85	3.14	2.03	3.48	2.17
48	9.19	12.32	13.34	18.96	86	2.92	1.85	3.22	1.96
49	9.13	12.00	13.21	18.26	87	2.66	1.70	2.94	1.79
50	9.09	11.68	13.06	17.59	88	2.47	1.56	2.68	1.63
51	8.99	11.36	12.89	16.94	89	2.23	1.44	2.42	1.50
52	8.95	11.05	12.72	16.31	90	2.03	1.30	2.14	1.34
53	8.87	10.76	12.52	15.72	91	1.79	1.17	1.89	1.19
54	8.77	10.46	12.31	15.14	92	1.57	1.03	1.65	1.07
55	8.67	10.19	12.09	14.60	93	1.37	.75	1.42	.83
56	8.56	9.92	11.86	14.09	94	1.00	...	1.07	...
57	8.45	9.68	11.62	13.61	95	.75	...	.83	...

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 38—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE.

Fire Department Relief Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
22	4	\$ 4,000	5,009	\$7,515,390	50	47	\$96,100	321	\$661,190
23	151	151,400	5,005	7,511,390	51	40	85,900	274	565,090
24	122	122,000	4,854	7,359,990	52	42	81,900	234	479,190
25	110	110,400	4,732	7,237,990	53	26	51,200	192	397,290
26	130	142,400	4,622	7,127,590	54	30	64,390	166	346,090
27	261	304,000	4,492	6,985,190	55	30	64,400	136	281,700
28	172	203,200	4,231	6,681,190	56	21	38,200	106	217,300
29	244	314,700	4,059	6,477,990	57	19	42,100	85	179,100
30	230	299,500	3,815	6,163,290	58	7	12,800	66	137,000
31	219	300,200	3,585	5,863,790	59	13	23,000	59	124,200
32	268	377,600	3,366	5,563,590	60	6	15,900	46	101,200
33	257	366,100	3,098	5,185,990	61	12	23,900	40	85,300
34	248	353,400	2,841	4,819,890	62	5	7,700	28	61,400
35	254	382,000	2,593	4,466,490	63	5	10,700	23	53,700
36	258	386,200	2,339	4,084,490	64	6	13,600	18	43,000
37	230	360,300	2,081	3,698,290	65	2	3,900	12	29,400
38	284	454,700	1,851	3,337,990	66	5	10,300	10	25,500
39	194	311,000	1,567	2,883,290	67	1	7,500	5	15,200
40	170	285,200	1,373	2,572,290	68	..	....	4	7,700
41	145	252,500	1,203	2,287,090	69	1	1,600	4	7,700
42	143	263,400	1,058	2,034,590	70	1	1,400	3	6,100
43	104	186,100	915	1,771,190	71	1	1,400	2	4,700
44	120	219,700	811	1,585,090	72	..	....	1	3,300
45	113	213,400	691	1,365,390	73	..	....	1	3,300
46	78	146,900	578	1,151,090	74	1	3,300	1	3,300
47	61	123,000	500	1,005,090	75	..	....	...	.....
48	74	135,700	439	882,090					
49	44	85,200	365	746,390					

TABLE 39—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES, WHO HAVE HAD THE INDICATED SERVICE OR MORE

Fire Department Relief Fund

Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	129	\$129,000	5,009	\$7,515,390	16	95	\$168,300	981	\$1,893,490
1	699	700,800	4,880	7,386,390	17	167	294,100	886	1,725,190
2	108	115,200	4,181	6,685,590	18	146	243,400	719	1,431,090
3	220	285,600	4,073	6,570,390	19	151	283,400	573	1,187,690
4	126	178,500	3,853	6,284,790	20	67	124,800	422	904,290
5	211	298,800	3,727	6,106,290	21	56	113,800	355	779,490
6	214	300,200	3,516	5,807,490	22	36	69,900	299	665,690
7	391	558,900	3,302	5,507,290	23	40	89,900	263	595,790
8	293	415,500	2,911	4,948,390	24	29	60,400	223	505,890
9	320	474,800	2,618	4,532,890	25	9	20,000	194	445,490
10	364	557,500	2,298	4,058,090	26	29	63,400	185	425,490
11	325	501,300	1,934	3,500,590	27	16	41,390	156	362,090
12	119	197,100	1,609	2,999,290	28	12	32,300	140	320,700
13	211	373,600	1,490	2,802,190	29	23	48,900	128	288,400
14	88	150,400	1,279	2,428,590	30 & over	105	239,500	105	239,500
15	210	384,700	1,191	2,278,190					

**TABLE 40—NUMBER AND PENSIONS OF ALL DISABILITY
PENSIONERS* CLASSIFIED BY AGE**

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
30	2	\$870	58	6	\$4,720
31	1	700	59	3	2,170
32	2	940	60	13	10,310
33	2	870	61	3	2,100
34	2	1,230	62	6	5,350
35	8	5,170	63	2	1,400
36	5	2,580	64	4	3,150
37	7	4,210	65	7	4,500
38	8	5,010	66	4	2,650
39	6	4,070	67	10	7,380
40	16	11,850	68	7	6,800
41	14	9,900	69	6	3,670
42	13	10,320	70	7	5,330
43	10	7,100	71	5	3,170
44	14	11,570	72	7	5,050
45	9	7,300	73	3	2,230
46	7	5,580	74	6	5,580
47	8	6,020	75	4	3,000
48	6	4,300	76	5	3,380
49	6	4,400	77	2	2,250
50	5	3,270	78	3	1,870
51	7	5,310	79	2	1,550
52	14	11,400	80	2	3,200
53	5	4,350	81	..	...
54	3	2,100	82	..	...
55	5	4,160	83	2	1,680
56	5	4,100			
57	8	6,630			
Total.....				317	\$237,800

*Includes 40 partial disability pensioners.

TABLE 41—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE.**Fire Department Relief Fund**

Age	Number	Pensions	Age	Number	Pensions
42	1	\$700	64	13	\$15,700
43	3	3,300	65	17	13,930
44	5	5,150	66	10	10,850
45	10	9,300	67	18	17,370
46	13	17,270	68	16	17,550
47	20	19,300	69	21	18,850
48	18	10,430	70	13	12,310
49	24	23,800	71	19	16,690
50	20	18,310	72	11	10,080
51	25	29,480	73	11	8,930
52	27	22,360	74	8	6,150
53	44	40,550	75	8	6,100
54	24	23,510	76	6	5,050
55	32	28,080	77	3	2,910
56	19	18,010	78	2	1,680
57	15	14,350	79	2	1,780
58	24	21,020	80	2	1,600
59	19	22,230	81	..	...
60	13	13,480	82	..	...
61	24	20,240	83	1	600
62	8	7,230			
63	13	14,480	Total	582	\$556,710

TABLE 42—NUMBER AND PENSIONS OF ALL WIDOW PENSIONERS CLASSIFIED BY AGE**Fire Department Relief Fund**

Age	Number	Pensions	Age	Number	Pensions
27	4	\$1,200	56	17	\$5,100
28	4	1,900	57	14	4,200
29	4	2,400	58	16	5,900
30	5	1,900	59	19	6,400
31	8	2,800	60	11	3,300
32	9	3,400	61	20	6,000
33	10	4,800	62	15	5,100
34	15	6,000	63	16	4,800
35	4	1,200	64	30	9,700
36	11	4,100	65	20	6,000
37	7	3,100	66	18	5,800
38	12	4,800	67	12	3,600
39	15	6,300	68	14	4,200
40	20	7,400	69	12	3,600
41	17	5,400	70	7	2,800
42	21	7,100	71	9	2,700
43	12	4,700	72	10	3,000
44	12	4,200	73	6	1,800
45	9	3,400	74	6	1,800
46	14	4,200	75	9	2,700
47	17	6,000	76	6	1,800
48	20	7,400	77	5	1,500
49	18	6,100	78	..	...
50	19	5,500	79	1	300
51	12	3,600	80	2	600
52	15	5,100	81	2	600
53	18	5,400	82	1	300
54	24	8,500			
55	15	4,500	Totals	669	\$226,000

**TABLE 43—NUMBER AND PENSIONS OF ALL CHILDREN
PENSIONERS CLASSIFIED BY AGE**

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
1	..	...	11	2	\$420
2	2	\$220	12	3	320
3	1	150	13	4	1,250
4	2	220	14	15	3,320
5	..	...	15	9	2,420
6	1	150	16	12	2,890
7	2	450	17	4	850
8	2	170	18	4	750
9	2	370	Totals	70	\$15,040
10	5	1,090			

**TABLE 44—NUMBER AND PENSIONS OF ALL DEPENDENT
PARENT PENSIONERS CLASSIFIED BY AGE**

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
53	2	\$780	74	2	\$650
54	1	300	75	3	1,100
55	1	400	76	2	600
56	..	...	77	2	600
57	..	...	78	..	...
58	2	900	79	1	300
59	1	180	80	..	...
60	5	1,480	81	2	600
61	1	500	82	1	300
62	..	...	83	1	300
63	2	600	84	..	...
64	..	...	85	1	300
65	2	800	86	..	...
66	4	1,400	87	..	...
67	3	1,100	88	..	...
68	1	300	89	..	...
69	1	500	90	..	...
70	2	800	91	1	300
71	2	600	Totals	48	\$16,290
72	2	600			
73	..	...	

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets and shows the complete financial condition of the fund as of that date.

TABLE 45—A VALUATION OF ASSETS AND LIABILITIES OF JUNE

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 1,686 Pensioners now on the pension roll of the fund as follows:	
Service Pensioners—	
582 annual pensions aggregating.....\$556,710	\$5,318,769
Disability Pensioners—	
277 annual pensions aggregating \$210,180, because of Total Disability.....	1,731,505
40 annual pensions aggregating \$27,620, because of Partial Disability.....	195,623
Widow Pensioners—	
669 annual pensions aggregating.....\$226,000	2,710,946
Children Pensioners—	
70 annual pensions aggregating.....\$15,040	59,025
Dependent Parent Pensioners—	
48 annual pensions aggregating.....\$16,290	133,038
Total Pensions Entered Upon.....	\$10,148,906
Pensions to Dependents of present pensioners:	
Widows' Pensions—	
Widows of Service Pensioners.....	\$688,116
Widows of Disability Pensioners.....	...
Total Disability.....	189,819
Partial Disability.....	37,470
Children's Pensions—	
Children of Service Pensioners.....	15,447
Children of Disability Pensioners.....	...
Total Disability.....	21,249
Partial Disability.....	387
Total Prospective Pensions to Dependents of Present Pensioners.....	\$952,488
Pensions to such Employees as will retire from the present active force of 5,009 employees:	
Service Pensions.....	\$20,198,855
Disability Pensions, on account of—	
Actual Performance of Duty.....	236,412
Other Causes.....	...
During first 10 years' service.....	187,775
After 10 years' service.....	4,305,076
Total Prospective Pensions to Employees.....	\$24,928,118
Pensions to Dependents of such employees of the present active force, as will die in service or while on pension:	
Widows' Pensions—	
Widows of employees who will die in Performance of Duty.....	\$535,018
Widows of employees who will die from Other Causes in service.....	1,250,712
Widows of employees who will die as Service Pensioners....	2,228,328
Widows of employees who will die as Disability Pensioners....	1,185,312
Children's Pensions—	
Children of employees who will die in Performance of Duty....	31,163
Children of employees who will die from Other Causes in service.....	72,138
Children of employees who will die as Service Pensioners....	56,649
Children of employees who will die as Disability Pensioners....	64,764
Dependent Parents' Pensions—	
Parents of employees who will die in Performance of Duty....	29,072
Parents of employees who will die from other causes in service.....	91,254
Total Prospective Pensions to Dependents of Employees in Service.....	\$5,544,410
Total Pensions Not Entered Upon.....	\$31,425,016
Grand Total.....	\$41,573,922

and liabilities of the Fire Department Relief Fund as of June 30, 1914,

**THE FIRE DEPARTMENT RELIEF FUND VALUED AS OF
30, 1914.**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand.....	\$850,446
Contribution by Employees.....	...
*Deficiency.....	40,723,476
Grand Total.....	\$41,573,922

*NOTE—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however will probably be less than \$9,308,300.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 46—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Fire Department Relief Fund

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total	Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
0	1914	\$228,131	\$542,190	\$222,736	\$14,640	\$15,761	\$1,023,458	37	1951	\$5,376	\$6,013	\$5,793	...	72	\$37,354
1	1915	210,535	518,550	215,778	13,372	14,776	973,011	38	1952	4,603	4,103	23,338	...	52	32,186
2	1916	195,048	494,757	208,846	10,464	13,621	922,736	39	1953	3,900	2,821	21,035	...	36	27,792
3	1917	180,364	470,846	201,937	8,034	12,901	874,082	40	1954	3,275	1,838	18,887	...	26	24,016
4	1918	166,586	446,904	194,068	4,732	11,998	825,188	41	1955	2,736	1,132	16,885	...	16	20,769
5	1919	153,725	419,497	188,199	3,488	11,126	776,035	42	1956	2,259	674	15,027	...	9	17,969
6	1920	141,715	399,126	181,379	3,163	10,202	735,675	43	1957	1,841	386	13,318	...	4	15,549
7	1921	130,599	375,505	174,064	2,741	9,497	692,856	44	1958	1,496	207	11,747	...	2	13,452
8	1922	120,054	352,164	167,862	1,670	8,738	650,488	45	1959	1,191	106	10,306	...	...	11,603
9	1923	110,347	328,892	161,189	1,306	8,013	609,747	46	1960	937	52	8,995	...	...	9,984
10	1924	101,286	306,779	154,560	1,137	7,321	571,083	47	1961	739	23	7,801	...	...	8,563
11	1925	92,852	284,892	148,007	702	6,603	533,116	48	1962	559	9	6,720	...	...	7,288
12	1926	85,028	264,703	141,431	557	6,040	497,759	49	1963	417	3	5,756	...	...	6,176
13	1927	77,767	243,323	135,149	555	5,454	462,248	50	1964	308	...	4,898	...	...	5,206
14	1928	71,051	223,818	128,558	346	4,904	428,977	51	1965	222	...	4,054	...	...	4,276
15	1929	64,792	205,312	123,483	204	4,393	398,184	52	1966	156	...	3,467	...	...	3,623
16	1930	58,938	187,867	116,612	...	3,920	367,337	53	1967	108	...	2,879	...	...	3,087
17	1931	53,784	171,488	110,673	...	3,485	339,430	54	1968	72	...	2,360	...	...	2,432
18	1932	48,800	136,142	104,873	...	3,082	302,897	55	1969	48	...	1,911	...	...	1,959
19	1933	44,305	141,845	98,398	...	2,711	287,259	56	1970	31	...	1,531	...	...	1,562
20	1934	40,167	139,049	93,789	...	2,369	275,374	57	1971	19	...	1,217	...	...	1,236
21	1935	36,359	116,019	88,312	...	2,059	242,740	58	1972	11	...	954	...	...	965
22	1936	32,903	104,337	83,114	...	1,782	222,136	59	1973	5	...	737	...	...	742
23	1937	29,715	93,396	78,105	...	1,535	202,751	60	1974	1	...	562	...	...	563
24	1938	26,796	83,153	73,214	...	1,315	184,478	61	1975	...	...	420	...	...	420
25	1939	24,129	73,564	68,521	...	1,118	167,332	62	1976	...	...	306	...	...	306
26	1940	21,679	64,614	63,996	...	942	151,231	63	1977	...	...	213	...	...	213
27	1941	19,435	56,267	59,651	...	789	136,132	64	1978	...	...	141	...	...	141
28	1942	17,387	48,502	55,483	...	654	122,026	65	1979	...	...	90	...	...	90
29	1943	15,502	41,329	51,477	...	537	108,845	66	1980	...	...	54	...	...	54
30	1944	13,777	34,751	47,658	...	436	96,622	67	1981	...	...	29	...	...	29
31	1945	12,212	28,784	43,999	...	352	85,347	68	1982	...	...	16	...	...	16
32	1946	10,782	23,447	40,536	...	282	75,047	69	1983	...	...	6	...	...	6
33	1947	9,472	18,740	37,228	...	224	65,664	70	1984	...	...	1	...	...	1
34	1948	8,289	14,669	34,137	...	175	57,270								
35	1949	7,224	11,208	31,188	...	134	49,754								
36	1950	6,253	8,331	28,407	...	90	43,090								
Total....		\$2,697,998	\$7,492,207	\$4,369,809	\$67,111	\$179,715	\$14,806,840								

* Date year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Fire Department, expressed as a percentage of the employee's salary.

TABLE 47—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE FIRE DEPARTMENT RELIEF FUND

AGE AT ENTRANCE	PENSION TO EMPLOYEES				PENSION TO WIDOWS OF				PENSION TO CHILDREN OF				PENSION TO DEPENDENT PARENTS OF				
	Total (1)+(2)+(3)+(4)	Service Pension (1)	DISABILITY PENSION				Total (5)+(6)+(7)	ACTIVES DYING		Total (8)+(9)+(10)	ACTIVES DYING		Total (11)+(12)	ACTIVES DYING			
			In Per- formance of Duty	Not in Per- formance of Duty				In Per- formance of Duty	Not in Per- formance of Duty		In Per- formance of Duty	Not in Per- formance of Duty		In Per- formance of Duty	Not in Per- formance of Duty		
				No Limita- tion	With Service of Less than 10 Years	With Service of 10 Years or More										In Per- formance of Duty	Not in Per- formance of Duty
20	14.35	8.46	2.67	.18	.11	2.38	.46	.81	1.59	.03	.06	.20	.04	.16			
21	15.09	8.91	2.80	.19	.14	2.47	.49	.85	1.67	.03	.06	.20	.04	.16			
22	15.86	9.36	2.92	.19	.18	2.55	.52	.90	1.77	.03	.07	.21	.05	.16			
23	16.71	9.82	3.05	.21	.21	2.63	.56	.96	1.92	.04	.07	.21	.05	.16			
24	17.09	10.29	3.18	.22	.25	2.71	.62	1.05	2.12	.04	.08	.22	.05	.17			
25	18.75	10.74	3.32	.23	.30	2.79	.69	1.16	2.38	.05	.08	.23	.06	.17			
26	19.73	11.17	3.47	.24	.35	2.88	.75	1.25	2.62	.05	.09	.23	.06	.16			
27	20.74	11.55	3.62	.25	.42	2.95	.81	1.36	2.91	.05	.10	.22	.06	.15			
28	21.60	11.90	3.76	.26	.52	2.98	.86	1.44	3.15	.05	.10	.21	.06	.15			
29	22.39	12.16	3.90	.28	.64	2.98	.90	1.52	3.41	.06	.10	.20	.05	.15			
30	23.10	12.35	4.04	.29	.80	2.95	.93	1.59	3.69	.06	.10	.19	.05	.14			
31	23.74	12.47	4.18	.31	.99	2.88	.95	1.67	3.97	.06	.10	.18	.05	.13			
32	24.30	12.51	4.31	.32	1.20	2.79	.96	1.73	4.28	.06	.11	.17	.04	.13			
33	24.96	12.59	4.46	.33	1.44	2.69	.97	1.81	4.61	.06	.11	.18	.04	.14			
34	25.56	12.52	4.61	.35	1.69	2.57	.98	1.90	5.01	.06	.11	.18	.04	.14			
35	26.13	12.42	4.76	.35	1.95	2.46	.98	1.98	5.43	.06	.12	.19	.05	.14			
36	26.80	12.29	4.91	.34	2.23	2.34	.99	2.09	5.93	.06	.12	.20	.05	.15			
37	27.58	12.19	5.07	.34	2.50	2.23	.99	2.21	6.50	.05	.13	.21	.05	.16			
38	28.33	12.01	5.19	.32	2.74	2.13	.99	2.35	7.14	.05	.13	.22	.05	.17			
39	29.02	11.86	5.28	.31	2.94	2.03	.97	2.48	7.75	.05	.13	.22	.05	.18			
40	29.93	11.70	5.33	.28	3.11	1.94	.96	2.66	8.56	.05	.14	.23	.05	.18			

TEACHERS' RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Teachers' Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

- (1) Upon application after 30 years' service, provided 15 years of it was in the schools of New York City, a pension, in the discretion of the retirement board, of one-half final salary, with the limitation of a minimum annuity of \$600; a maximum annuity of \$1,500 for teachers and principals, and of \$2,000 for supervising officials.*
- (2) Upon disability occurring after 20 years' service, provided 15 of these years have been served in the schools of New York City, a pension of one-sixtieth of final salary for each year of service, not to exceed one-half final salary.

Contributions

BY EMPLOYEE

One percentum of salary, not to exceed \$30 per annum for teacher or principal; \$40 per annum for supervising official.

BY CITY

Indirect contributions:

Miscellaneous revenues, such as net absence deductions from salary roll; 5% of excise moneys.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

- Rate of withdrawal from service due to resignation or dismissal
- Rate of death in active service
- Rate of disability retirement
- Rate of service retirement
- Rate of change of salary
- Rate of death of service pensioners
- Rate of death of disability pensioners

*The president and professors of Hunter College are entitled to have their annuities increased to multiples of \$1000.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The schedules for employees of the Department of Education and Hunter College were divided into two classes; one including the teachers and supervising staff who are covered by the Teachers' Retirement Fund, the other including the civil service and janitorial employees who are covered by the City of New York Employees' Retirement Fund. The schedules for the latter class were subdivided and are included under the various divisions of the City of New York Employees' Retirement Fund. The cards for the teachers' fund were subdivided by sex because a difference between the men and women teachers in respect to the mortality and service experience made it necessary to develop tables for each group separately.

The experience of the Hunter College teachers was not included with that of the regular school teachers in determining the rates, because the Hunter College experience is relatively small and involves comparatively small financial liabilities, and yet its inclusion with that of the other teachers might have rendered the rates derived less applicable to the more numerous and financially more important class of regular school teachers. The rates pertaining to the regular school teachers, however, were used in the valuation of pensions for Hunter College teachers, in view of the apparent similarity of the personnel and duties and the fact that they are both subject to the same laws.

The cards for members of the active service of Hunter College were tabulated separately and valued separately, so that the extent of the liability as regards this special group might be individually considered. This liability, however, is not shown separately in the balance sheet given in this report.

Special methods of handling data

The Teachers' Retirement Fund was valued as of June 30, 1912, by Messrs. Hutcheson and Thompson, Actuaries of the Mutual Life Insurance Company of New York City. They developed service and mortality tables at that time based on the experience of the service during a period of five years preceding the date of valuation. The rates developed by these actuaries, as set forth in their report in 1913, were checked into the experience of the funds during the period of observation covered by the Pension Commission and wherever the actual experience had not been very different from that expected by the use of their rates, their rates were adopted. In other cases new rates were developed by the Commission in accordance with the general methods outlined in the first section of this report.*

The general methods previously outlined were employed in developing the data to show unadjusted rates and in graduating the unadjusted rates.

*For detailed discussions of these differences reference may be made to "The Report of the Commission on Pensions on the Teachers' Retirement Fund," which gives a summary comparison of actual and expected cases by use of the former rates.

The extent of the experience of the regular school teachers is shown in the following tables:

**TABLE 48—SUMMARY OF EXPOSURE AND SEPARATIONS—
ACTIVE SERVICE**

Teachers' Retirement Fund

	Men	Women
Number Exposed to Risk.....	13,984.5	98,463.5
Total Number of Separations.....	364	4,213
Total Withdrawals.....	243	3,111
Resignations.....	239	3,102
Dismissals.....	4	9
Total Deaths.....	56	362
Total Separations by Disability.....	11	208
Total Service Retirements.....	54	532

TABLE 49—SUMMARY OF EXPOSURE—SALARY

Teachers' Retirement Fund—Men and Women

Class	Number of Annual Salaries	Total Payroll
Active Members:		
Men.....	11,413	\$23,808,080
Women.....	75,643	90,929,358
Pensioned Members:		
Men.....	100	315,540
Women.....	1,399	2,143,320
Total.....	88,555	\$117,196,298

**TABLE 50—SUMMARY OF EXPOSURE AND SEPARATIONS*—
EMPLOYEE PENSIONERS**

Teachers' Retirement Fund—Men and Women

Class	Exposed to Risk	Deaths
Disability Pensioners:		
Men.....	33	1
Women.....	1,437	40
Service Pensioners:		
Men.....	855	70
Women.....	5,885	180
Total.....	8,210	291

* This table includes experience of fund prior to 1908.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. In the report recently submitted by the Pension Commission on the Teachers' Retirement Fund, no comparisons were made with rates developed from

the experience of the other New York City funds, because when it was prepared these other rates were not available. The present report makes possible comparisons with the rates of other city departments. The comparative rates from other teachers' funds, given in the earlier report, are not repeated, although in some cases reference is made to them.

No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

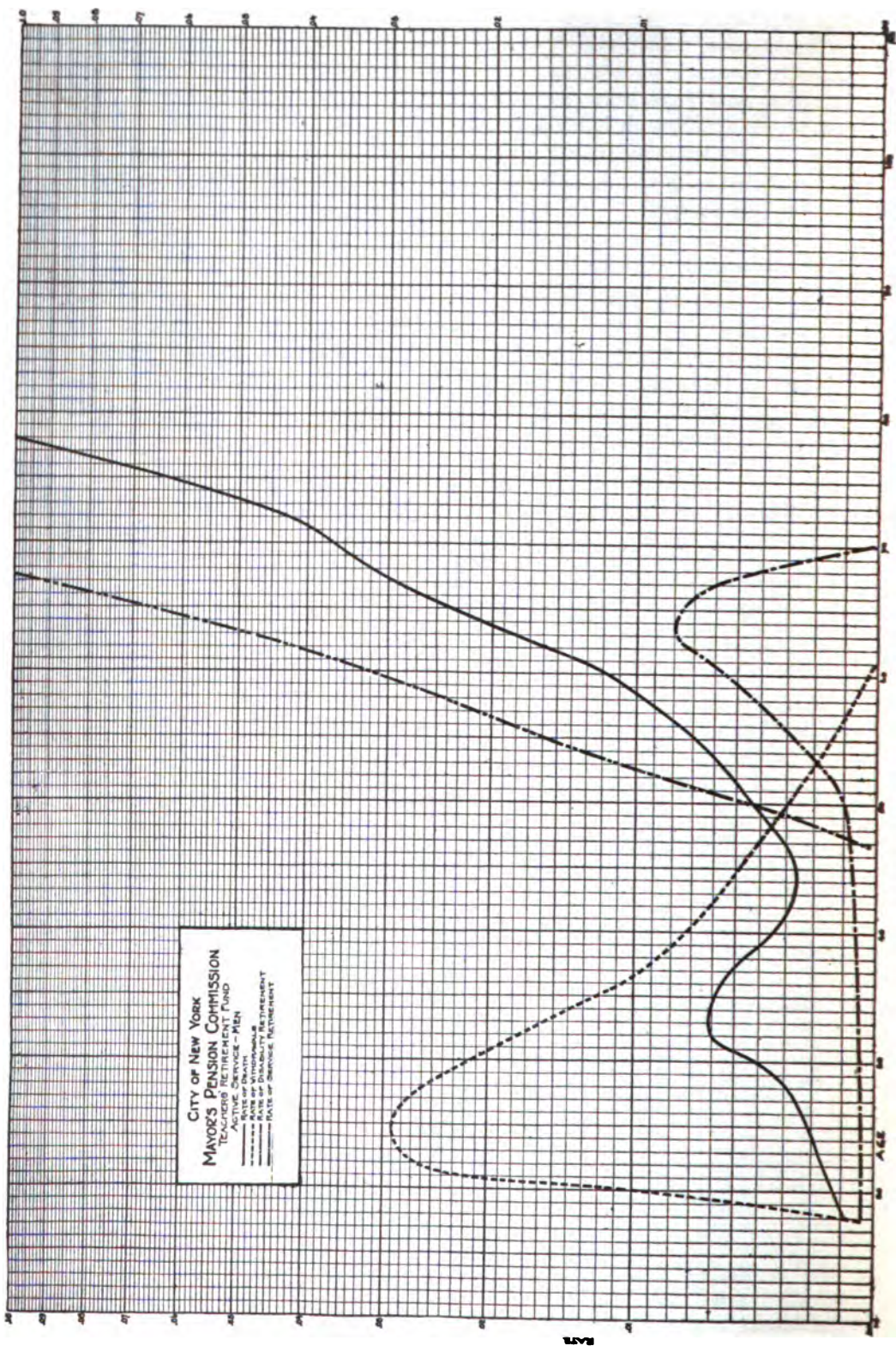
The active service—men

The following table shows the rates used in constructing the active service table. The active service rates for men are those developed in the report made by Messrs. Hutcheson and Thompson. To visualize the increases and decreases in the rates from age to age and their relative importance at various ages, a diagram is given on page 98 showing the rates plotted on cross section paper.

TABLE 51—RATES OF SEPARATION FROM ACTIVE SERVICE

Teachers' Retirement Fund—Men

Age	Rates of Withdrawal	Rates of Death	Rates of Disability Retirement	Rates of Service Retirement	Age	Rates of Withdrawal	Rates of Death	Rates of Disability Retirement	Rates of Service Retirement
	$wq_z^{(a)}$	$dq_z^{(a)}$	$trq_z^{(a)}$	$srq_z^{(a)}$		$wq_z^{(a)}$	$dq_z^{(a)}$	$trq_z^{(a)}$	$srq_z^{(a)}$
18	.0012	.0009	...	...	50	.0029	.0045	.0010	.0041
19	.0047	.0011	...	...	51	.0026	.0049	.0010	.0061
20	.0110	.0013	...	...	52	.0023	.0053	.0013	.0084
21	.0226	.0014	...	...	53	.0020	.0057	.0018	.0108
22	.0271	.0017	...	...	54	.0017	.0062	.0023	.0132
23	.0284	.0018	...	...	55	.0014	.0070	.0028	.0159
24	.0290	.0020	...	...	56	.0012	.0080	.0033	.0185
25	.0291	.0022	...	...	57	.0010	.0088	.0038	.0212
26	.0285	.0024	...	...	58	.0008	.0096	.0043	.0241
27	.0275	.0026	...	...	59	.0005	.0104	.0049	.0274
28	.0262	.0030	...	...	60	.0003	.0113	.0056	.0313
29	.0237	.0035	...	...	61	.0001	.0134	.0064	.0360
30	.0216	.0043	...	...	62	...	.0155	.0073	.0413
31	.0195	.0054	...	...	63	...	.0180	.0082	.0478
32	.0175	.0061	...	...	64	...	.0208	.0080	.0559
33	.0154	.0063	...	...	65	...	.0234	.0076	.0656
34	.0141	.0061	...	...	66	...	.0257	.0070	.0766
35	.0126	.0059	...	...	67	...	.0285	.0062	.0916
36	.0109	.0056	...	...	68	...	.0318	.0044	.1108
37	.0098	.0053	...	...	69	...	.0338	.0022	.1326
38	.0087	.0048	...	...	70	...	.0360	.0006	.1680
39	.0080	.0041	.0001	...	71	...	.0387	...	.2075
40	.0073	.0033	.0002	...	72	...	.0424	...	.2505
41	.0068	.0032	.0003	...	73	...	.0472	...	.2980
42	.0063	.0028	.0004	...	74	...	.0537	...	.3470
43	.0058	.0028	.0005	...	75	...	.0620	...	.3980
44	.0053	.0027	.0006	...	76	...	.0726	...	.4510
45	.0050	.0026	.0007	...	77	...	.0858	...	.5060
46	.0046	.0028	.0008	...	78	...	.1020	...	.5630
47	.0041	.0033	.0008	.0004	79	...	.1214	...	.6240
48	.0037	.0035	.0009	.0014	80	...	.1445	...	.6890
49	.0033	.0038	.0009	.0026	81	...	.1586	...	.7610



RATES OF RESIGNATION AND DISMISSAL

Practically all withdrawals from the active service are reported as resignations, consequently but one rate was developed and no attempt was made to distinguish between resignations and dismissals. The total rate of withdrawal from active service for men ranks eighth among the eleven withdrawal rates developed for New York City funds. The only lower rates are those for the Police, the Supreme Court and the Fire Departments.

Compared with the withdrawal rate for men teachers in the New Zealand teachers' pension fund, the New York rate is slightly higher between the ages of 24 and 31, although it is lower above these ages. The rate of withdrawal among English and Scottish men teachers, according to the report on Elementary School Teachers' Superannuation Fund, 1914, is very much lower throughout than that for New York teachers.

RATE OF DEATH

But one death rate has been used covering all deaths in active service. The rate shows a marked decrease between ages 30 and 45 and is the only death rate showing a decrease with advancing age. The explanation of this condition lies in the fact that the experience for men was not very large and the actuaries did not attempt to graduate out this peculiar result obtained from the data. Although mortality rates obtained from such classes sometimes show a slight decline with advancing age during this period of life, the decrease is ordinarily removed by the graduation.

Taken as a whole the death rate for men teachers is the lowest found in the city service with the single exception of that for members of the College of the City of New York Retirement Fund. Compared with the rate for English and Scottish teachers it is somewhat higher in the earlier ages and lower in the later ages, a condition probably accounted for by the fact that the Scottish teachers may retire if disabled after ten years of service, whereas in New York City the limitation is twenty years.

RATE OF DISABILITY

The rate of disability used for men teachers is the lowest rate for the city service. The rate would seem to indicate that the man school teacher has a healthful occupation and that he does not take advantage of the disability provisions of the retirement law unless his health becomes so impaired that he cannot continue in his profession. When compared with the women teachers' and other disability rates, this rate is found to be very low.

RATE OF SERVICE RETIREMENT

The rate of service retirement, taken as a whole up to age 65, ranks seventh among all rates for the city service, being higher than the rates used for the College of the City of New York, the Street Cleaning Department, and the three classes included in the City of New York Employees' Retirement Fund. The rate indicates that men do not ordinarily take advantage of the retirement provision as soon as they are eligible. If the experience under the disability retirement provision be recalled and considered with the provision, it appears that men teachers prefer to remain in active service rather than to retire on pension.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

The active service—women

The following table shows the rates used in constructing the active service table. The rates of death and withdrawal for women are those developed in the report made by Messrs. Hutcheson and Thompson. To visualize the increases and decreases in the rates from age to age and their relative importance at various ages, a diagram is given on page 101, showing the rates plotted on cross section paper.

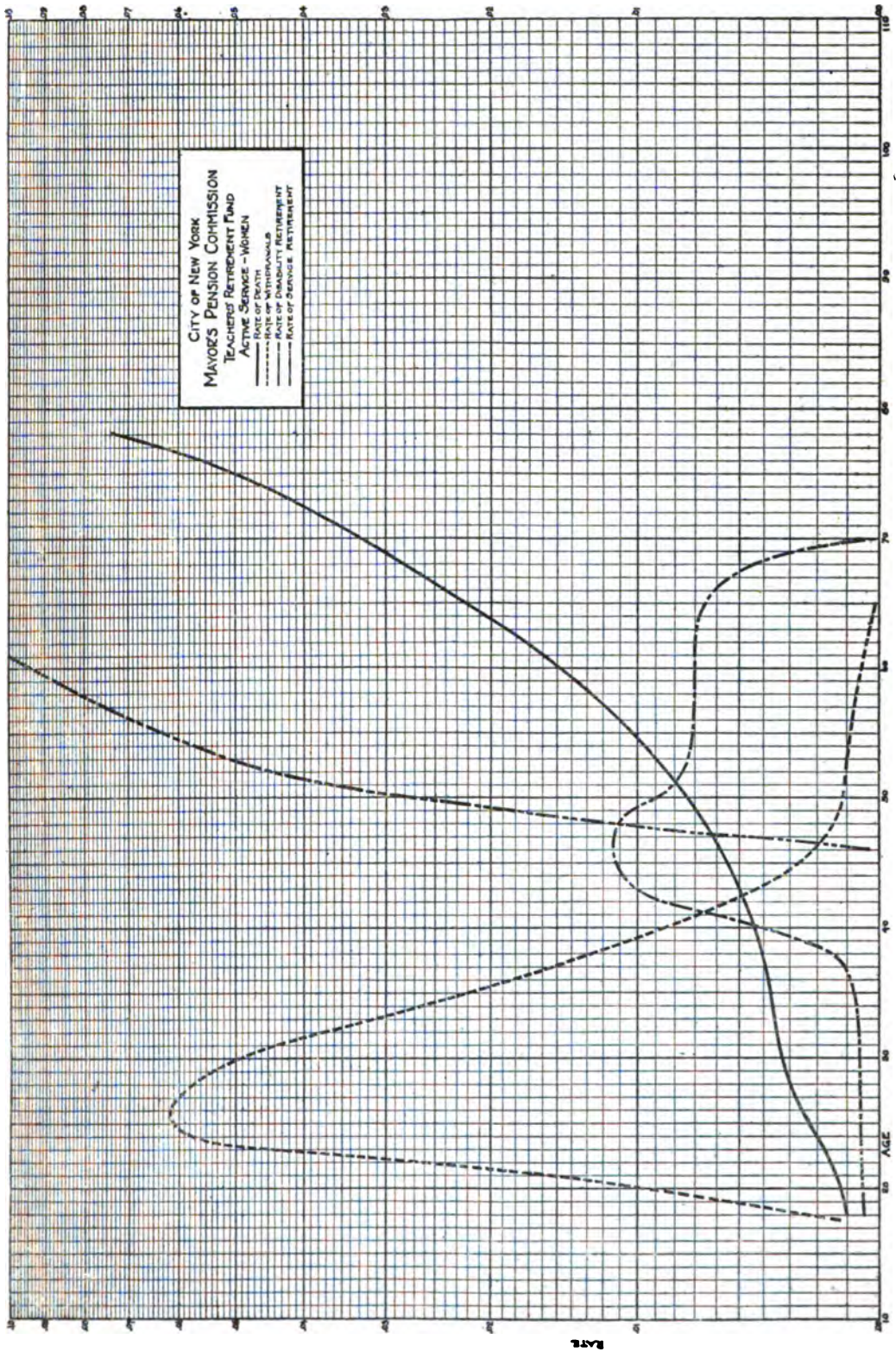
TABLE 52—RATES OF SEPARATION FROM ACTIVE SERVICE

Teachers' Retirement Fund—Women

Age	Rates of Withdrawal	Rates of Death	Rates of Disability Retirement	Rates of Service Retirement	Age	Rates of Withdrawal	Rates of Death	Rates of Disability Retirement	Rates of Service Retirement
	$wq_z^{(a)}$	$dq_z^{(a)}$	${}^tq_z^{(a)}$	${}^sq_z^{(a)}$		$wq_z^{(a)}$	$dq_z^{(a)}$	${}^tq_z^{(a)}$	${}^sq_z^{(a)}$
18	.0025	.0011	...	...	49	.0014	.0070	.0106	.0183
19	.0054	.0012	...	...	50	.0013	.0075	.0090	.0282
20	.0102	.0013	...	...	51	.0012	.0080	.0081	.0370
21	.0175	.0014	...	...	52	.0011	.0085	.0077	.0455
22	.0258	.0016	...	...	53	.0010	.0091	.0074	.0520
23	.0455	.0018	...	...	54	.0010	.0097	.0073	.0578
24	.0581	.0020	...	...	55	.0009	.0104	.0072	.0637
25	.0613	.0023	...	...	56	.0008	.0112	.0071	.0697
26	.0621	.0025	...	...	57	.0007	.0120	.0071	.0752
27	.0606	.0028	...	...	58	.0007	.0129	.0071	.0819
28	.0579	.0030	...	...	59	.0006	.0139	.0071	.0883
29	.0541	.0032	...	...	60	.0005	.0150	.0071	.0950
30	.0498	.0033	...	...	61	.0004	.0162	.0070	.1028
31	.0445	.0034	...	...	62	.0003	.0175	.0070	.1109
32	.0384	.0035	...	...	63	.0002	.0189	.0069	.1200
33	.0322	.0036	...	...	64	.0001	.0204	.0068	.1318
34	.0263	.0036	...	...	65	.0001	.0221	.0065	.1502
35	.0218	.0036	...	...	66	...	.0240	.0061	.1745
36	.0182	.0037	...	...	67	...	.0260	.0054	.2040
37	.0152	.0039	.0004	...	68	...	.0282	.0044	.2430
38	.0127	.0040	.0016	...	69	...	.0306	.0030	.2890
39	.0106	.0042	.0029	...	70	...	.0332	.0001	.3370
40	.0089	.0044	.0045	...	71	...	.0361	...	.3880
41	.0072	.0046	.0064	...	72	...	.0392	...	.4400
42	.0058	.0048	.0088	...	73	...	.0426	...	.5040
43	.0044	.0050	.0103	...	74	...	.0463	...	.5660
44	.0034	.0053	.0110	...	75	...	.0503	...	.6280
45	.0027	.0056	.0113	...	76	...	.0556	...	.7000
46	.0022	.0059	.0114	.0003	77	...	.0631	...	.7820
47	.0018	.0062	.0114	.0053	7807378790
48	.0015	.0066	.0112	.0112	799860

TEACHERS

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RATES OF RESIGNATION AND DISMISSAL

As practically no dismissals were reported among women school teachers, but one rate of withdrawal was prepared. This rate ranks seventh among all rates of withdrawal, the lower rates being those for men teachers, policemen, Supreme Court employees and firemen. The rate increases rapidly in the earlier ages, reaching a maximum at about age 26, where it is one of the comparatively high rates. Beyond age 26 it decreases very rapidly and although between ages 22 and 41 it is higher than the rate for men teachers, beyond this period it drops considerably below the rate for men. That the rate of withdrawal is at its maximum at about age 25 is obviously the result of the resignations of women teachers who leave the service upon marriage.

Compared with other teachers' withdrawal rates, the rate for New York is below that obtaining in the New Zealand Teachers' Superannuation Fund, and generally below that applying in the Superannuation Fund for English and Scottish Women Teachers, although it exceeds that rate to age 27.

RATE OF DEATH

The death rate as a whole is lower among women teachers than among any other class except men teachers and members of the College of the City of New York Retirement Fund. The death rates for teachers were found to be the lowest existing in the New York City service. The next higher rate is that in the Supreme Court funds. The death rate for women teachers in New York is, however, slightly higher than the rate for women teachers in the English and Scottish Superannuation Fund. This may be partly explained by the fact that the latter fund has a disability provision allowing retirement after ten years of service.

RATE OF DISABILITY

The rate of disability for women teachers ranks about sixth among the ten rates developed for the city service, being lower than the rates for any class of employees whose work demands physical exertion and the highest of the rates for employees whose duties are of a clerical or more or less sedentary character. The rate increases faster than the rate for any other fund from about age 38, the first age at which retirement may take place, and reaches a maximum at age 46, after which it decreases very rapidly. The explanation of the decrease may be in the fact that during this period the teachers are eligible for service pension.

The rate is higher than that for English and Scottish women teachers from about age 38 up to about age 49, although the Scottish teachers have lower limitation on their retirement as regards years of service than the New York teachers.

RATE OF SERVICE RETIREMENT

Up to age 65 the rate of retirement for women school teachers is the third highest of such rates used for the city services, being exceeded only by the rates for the firemen and policemen. This rate, when considered in conjunction with the disability retirement rate, seems to indicate a desire on the part of women teachers to retire as soon as possible. This is

apparently unlike the conditions existing among the men teachers, both in the teachers' fund and the College of the City of New York.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

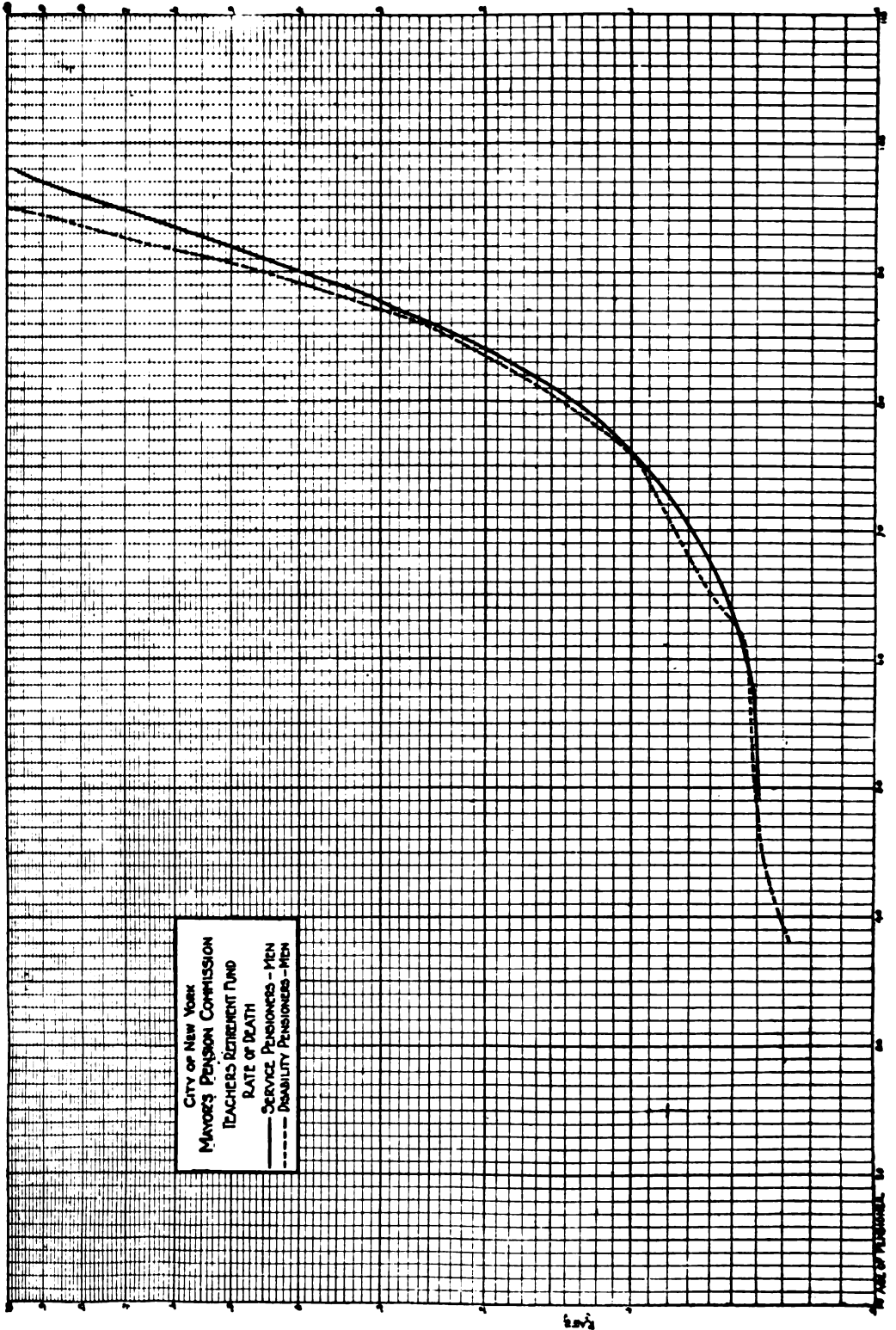
Pensioners—men and women

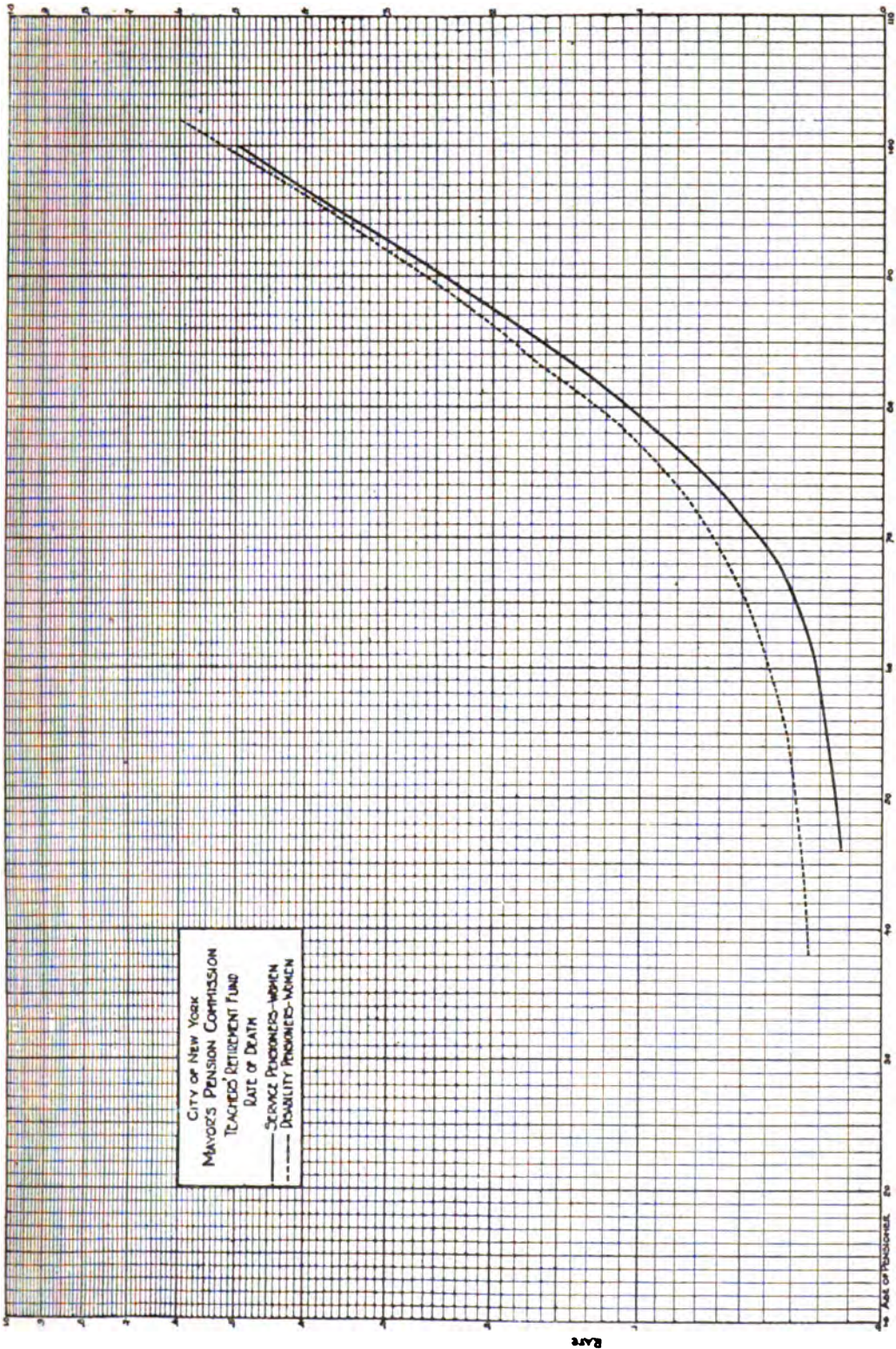
The following table shows the rates used in the construction of all the pensioners' tables for men and women. Diagrams showing the rates of mortality plotted on cross section paper are given on pages 104 and 105.

TABLE 53—RATES OF MORTALITY AMONG PENSIONERS

Teachers' Retirement Fund

AGE	DISABILITY		SERVICE		AGE	DISABILITY		SERVICE	
	Men	Women	Men	Women		Men	Women	Men	Women
38	.0280	.0241	...	...	70	.0775	.0633	.0698	.0436
39	.0297	.0244	...	...	71	.0812	.0671	.0738	.0477
40	.0313	.0247	...	...	72	.0848	.0714	.0778	.0523
41	.0327	.0250	...	...	73	.0882	.0759	.0823	.0573
42	.0339	.0253	...	...	74	.0914	.0810	.0875	.0629
43	.0354	.0257	...	...	75	.0944	.0866	.0933	.0689
44	.0367	.0260	...	...	76	.1023	.0930	.0999	.0755
45	.0382	.0264	...	...	77	.1111	.1000	.1070	.0826
46	.0388	.0268	.0385	.0132	78	.1208	.1080	.1152	.0902
47	.0394	.0272	.0387	.0137	79	.1317	.1165	.1248	.0988
48	.0400	.0278	.0389	.0143	80	.1445	.1260	.1358	.1079
49	.0405	.0283	.0391	.0148	81	.1586	.1370	.1497	.1177
50	.0409	.0290	.0393	.0153	82	.1743	.1483	.1647	.1284
51	.0412	.0296	.0395	.0159	83	.1916	.1605	.1820	.1397
52	.0416	.0302	.0397	.0164	84	.2114	.1725	.2020	.1521
53	.0418	.0311	.0399	.0169	85	.2356	.1851	.2250	.1652
54	.0421	.0320	.0402	.0175	86	.2657	.1990	.2525	.1795
55	.0423	.0329	.0407	.0181	87	.3030	.2140	.2840	.1947
56	.0425	.0340	.0411	.0187	88	.3467	.2290	.3180	.2110
57	.0426	.0350	.0418	.0194	89	.3959	.2450	.3580	.2284
58	.0429	.0363	.0426	.0201	90	.4546	.2630	.4040	.2469
59	.0432	.0377	.0436	.0209	91	.5325	.2825	.4560	.2666
60	.0436	.0392	.0448	.0218	92	.6343	.3030	.5110	.2876
61	.0453	.0409	.0460	.0229	93	.7342	.3240	.5750	.3098
62	.0469	.0427	.0476	.0240	94	.8571	.3465	.6500	.3332
63	.0509	.0448	.0494	.0255	95	1.0000	.3710	.7340	.3579
64	.0553	.0467	.0516	.0271	96	...	.3970	.8180	.3838
65	.0602	.0488	.0538	.0290	97	...	.4250	.9020	.4108
66	.0634	.0513	.0566	.0312	98	...	.4550	.9850	.4390
67	.0667	.0539	.0593	.0337	99	...	.4880	...	.4682
68	.0700	.0569	.0626	.0366	100	...	.5240	...	.4984
69	.0738	.0600	.0660	.0399	...	...	...	...	...





DISABILITY PENSIONERS' DEATH RATE—MEN

As the number of deaths to be expected among the disability pensioners according to the mortality rate derived by Mr. Hutcheson was about the same as the actual number found in the new experience, no change of rate was thought advisable. The rate for men teachers is slightly higher throughout than the rate for women teachers and the rate for disabled policemen, and beyond age 78 it is higher than that of the Fire Department. It is considerably below those of the other city funds. The rate is lower than that of the English and Scottish male teachers up to age 64 and slightly higher beyond.

SERVICE PENSIONERS' DEATH RATE—MEN

The actual number of deaths of service pensioners in the present experience is about 13% less than the expected deaths estimated by the application of Mr. Hutcheson's service pensioners' mortality rates. Because of this difference a new rate was graduated. This new rate, however, was not based on the actual experience recorded by the Commission but is a rate lying between the one found by Mr. Hutcheson and the one indicated by the actual experience reports of the Commission. Both the rate worked by Mr. Hutcheson and that worked by the Commission from actual experience are based on comparatively small numbers. Rather than to accept either one as correct and to reject entirely the other, it seemed safer to take a middle ground, which is doubtless more nearly the true ground, and does not involve so wide a possibility of error. Compared with the rates of the other city funds it ranks about fourth, being lower than that of the Street Cleaning Department, and although about the same as the Fire and Police Departments up to about age 80, it is slightly lower beyond. It is considerably higher than that of the women teachers throughout.

DISABILITY PENSIONERS' DEATH RATE—WOMEN

The mortality rate for women on the disability pensioners' roll is the lowest in the city service. It is lower than that of the English and Scottish women teachers up to age 50 and higher beyond. Beyond age 70 it is practically the same as the English and Scottish men teachers. Not only is the rate lower than any other rate used for the city services but it is lower than the majority of disability rates found in outside experiences, which apparently indicates that many women retire with but minor health impairments.

SERVICE PENSIONERS' DEATH RATE—WOMEN

There was very little difference between the death rates developed from the present and the previous experience, consequently Mr. Hutcheson's rate was adopted. It is the lowest rate used for any city service. It is slightly higher than the rate for English and Scottish women teachers and is also higher than the rate shown in McClintock's Annuity Table for Women.

SERVICE AND MORTALITY TABLE AND SALARY SCALE

The following tables are based on the rates discussed above, with the exception of the salary scales shown in connection with the active service tables. The salary scales were developed directly from the tabulation of employees' salaries.

TABLE 54—ACTIVE SERVICE TABLE AND SALARY SCALE
Teachers' Retirement Fund—Men

Age	Living $l_x^{(e)}$	With- drawals $w_x^{(e)}$	Deaths $d_x^{(e)}$	Separations by Disability $t_x^{(e)}$	Service Retire- ments $s_x^{(e)}$	Total Decre- ments	Salary Scale s_x	Age	Living $l_x^{(e)}$	With- drawals $w_x^{(e)}$	Deaths $d_x^{(e)}$	Separations by Disability $t_x^{(e)}$	Service Retire- ments $s_x^{(e)}$	Total Decre- ments	Salary Scale s_x
18	100,000	120	93	...	...	213	720	52	54,769	126	289	71	460	946	3,085
19	99,787	469	112	...	...	581	750	53	53,823	108	308	97	581	1,094	3,105
20	99,206	1,091	127	...	...	1,218	797	54	52,729	90	328	121	696	1,235	3,130
21	97,988	2,215	141	...	...	2,356	850	55	51,494	72	358	144	819	1,393	3,145
22	95,632	2,592	158	...	...	2,750	921	56	50,101	60	400	165	927	1,552	3,160
23	92,882	2,638	169	...	...	2,807	1,005	57	48,549	49	435	184	1,020	1,687	3,170
24	90,075	2,612	178	...	...	2,790	1,105	58	46,862	37	450	202	1,129	1,818	3,180
25	87,285	2,560	193	...	...	2,733	1,205	59	45,044	23	470	221	1,234	1,948	3,190
26	84,552	2,410	201	...	...	2,611	1,315	60	43,096	13	489	241	1,349	2,092	3,200
27	81,941	2,253	216	...	...	2,469	1,420	61	41,004	4	531	262	1,476	2,293	3,210
28	79,472	2,082	236	...	...	2,318	1,517	62	38,711	...	602	283	1,599	2,484	3,220
29	77,154	1,820	270	...	...	2,099	1,620	63	36,227	...	652	297	1,732	2,681	3,225
30	75,055	1,621	324	...	...	1,945	1,720	64	33,546	...	698	268	1,875	2,841	3,230
31	73,110	1,426	395	...	...	1,821	1,818	65	30,705	...	718	233	2,014	2,995	3,235
32	71,289	1,248	436	...	...	1,684	1,910	66	27,740	...	712	194	2,125	3,031	3,235
33	69,605	1,072	438	...	...	1,510	2,000	67	24,709	...	704	153	2,263	3,120	3,230
34	68,095	960	414	...	...	1,374	2,085	68	21,589	...	687	95	2,392	3,174	3,230
35	66,721	841	390	...	...	1,231	2,165	69	18,415	...	622	41	2,442	3,105	3,225
36	65,490	714	367	...	...	1,081	2,240	70	15,310	...	551	9	2,572	3,132	3,220
37	64,409	631	343	...	...	974	2,300	71	12,178	...	472	...	2,527	2,999	3,210
38	63,435	552	306	...	...	858	2,355	72	9,179	...	389	...	2,299	2,688	3,200
39	62,577	501	256	6	...	703	2,410	73	6,491	...	369	...	1,934	2,241	3,190
40	61,814	451	204	12	...	667	2,470	74	4,250	...	228	...	1,475	1,793	3,180
41	61,147	416	194	18	...	628	2,535	75	2,547	...	158	...	1,014	1,172	3,170
42	60,519	381	171	24	...	576	2,570	76	1,375	...	100	...	620	720	3,160
43	59,943	348	165	30	...	543	2,635	77	655	...	56	...	331	387	3,145
44	59,400	315	157	36	...	508	2,690	78	268	...	27	...	151	178	3,135
45	58,892	294	151	41	...	486	2,760	79	90	...	11	...	56	67	3,125
46	58,406	269	161	47	...	477	2,820	80	23	...	3	...	16	19	3,105
47	57,929	238	188	46	23	495	2,880	81	4	...	1	...	3	4	3,090
48	57,434	213	201	52	80	546	2,935	82	...	...	...	...	...	...	...
49	56,888	188	216	51	148	603	2,985	83	...	...	...	...	...	...	...
50	56,285	163	254	56	231	704	3,020	84	...	...	...	...	...	...	...
51	55,581	145	272	56	339	812	3,055	85	...	...	...	...	...	...	...

TABLE 55—ACTIVE SERVICE TABLE AND SALARY SCALE

Teachers' Retirement Fund—Women

Age	Living $l_x^{(a)}$	With- drawals $w_x^{(a)}$	Deaths $d_x^{(a)}$	Separations by Disability $f_x^{(a)}$	Service Retire- ments $o_x^{(a)}$	Total Decre- ments	Salary Scale s_x	Age	Living $l_x^{(a)}$	With- drawals $w_x^{(a)}$	Deaths $d_x^{(a)}$	Separations by Disability $f_x^{(a)}$	Service Retire- ments $o_x^{(a)}$	Total Decre- ments	Salary Scale s_x
18	100,000	250	108	...	...	358	668	52	31,720	35	269	245	1,443	1,992	1,758
19	99,642	538	117	...	...	655	672	53	29,728	30	270	220	1,546	2,066	1,762
20	98,987	1,010	126	...	...	1,136	681	54	27,662	28	269	201	1,599	2,097	1,770
21	97,851	1,713	138	...	...	1,851	693	55	25,565	23	266	184	1,628	2,101	1,775
22	96,000	2,477	150	...	...	2,627	710	56	23,404	19	262	167	1,635	2,083	1,781
23	93,373	4,248	164	...	...	4,412	733	57	21,381	15	257	152	1,607	2,031	1,789
24	88,961	5,169	178	...	...	5,347	762	58	19,350	14	249	137	1,585	1,985	1,795
25	83,614	5,126	189	...	...	5,135	801	59	17,305	10	242	123	1,533	1,908	1,801
26	78,299	4,862	198	...	...	5,060	850	60	15,457	8	232	109	1,468	1,817	1,809
27	73,239	4,438	203	...	...	4,641	900	61	13,640	5	221	96	1,402	1,724	1,814
28	68,598	3,972	207	...	...	4,179	961	62	11,916	4	208	83	1,322	1,617	1,820
29	64,419	3,486	205	...	...	3,691	1,021	63	10,299	2	195	71	1,236	1,504	1,830
30	60,728	3,024	202	...	...	3,226	1,080	64	8,795	1	179	60	1,159	1,399	1,840
31	57,592	2,559	196	...	...	2,755	1,136	65	7,396	...	164	49	1,111	1,324	1,850
32	54,747	2,101	193	...	...	2,294	1,192	66	6,072	...	145	37	1,060	1,242	1,860
33	52,453	1,689	187	...	...	1,876	1,250	67	4,830	...	126	26	985	1,137	1,872
34	50,577	1,330	182	...	...	1,512	1,305	68	3,693	...	104	17	897	1,018	1,882
35	49,065	1,070	178	...	...	1,248	1,360	69	2,675	...	82	8	773	863	1,900
36	47,817	870	179	...	...	1,049	1,406	70	1,812	...	59	2	610	671	1,915
37	46,768	711	181	19	...	911	1,450	71	1,141	...	41	...	443	484	1,930
38	45,857	583	185	72	...	840	1,491	72	657	...	26	...	289	315	1,950
39	45,017	477	189	132	...	798	1,529	73	342	...	15	...	172	187	1,968
40	44,219	394	193	198	...	785	1,560	74	155	...	7	...	88	95	1,986
41	43,434	313	199	278	...	790	1,590	75	60	...	3	...	38	41	2,005
42	42,644	247	205	374	...	826	1,613	76	19	...	1	...	13	14	2,030
43	41,818	184	210	432	...	826	1,630	77	5	...	...	...	4	4	2,055
44	40,992	139	217	449	...	805	1,658	78	1	...	...	...	1	1	2,075
45	40,187	109	224	453	...	786	1,679	79	...	...	...	...	...	...	...
46	39,401	87	232	450	12	781	1,697	80	...	...	...	...	...	...	...
47	38,620	70	241	441	203	955	1,710	81	...	...	...	...	...	...	...
48	37,695	56	249	421	422	1,148	1,720	82	...	...	...	...	...	...	...
49	36,517	51	256	386	668	1,361	1,730	83	...	...	...	...	...	...	...
50	35,156	46	262	318	991	1,617	1,740	84	...	...	...	...	...	...	...
51	33,539	40	267	271	1,241	1,819	1,750	85	...	...	...	...	...	...	...

TABLE 56—DISABILITY PENSIONERS' MORTALITY TABLE

Teachers' Retirement Fund—Men

Age	Living $l_x^{(1)}$	Dying $d_x^{(1)}$	Age	Living $l_x^{(1)}$	Dying $d_x^{(1)}$
40	100,000	3,132	68	28,687	2,014
41	96,868	3,168	69	26,673	1,968
42	93,700	3,179	70	24,705	1,914
43	90,521	3,202	71	22,791	1,851
44	87,319	3,206	72	20,940	1,776
45	84,113	3,215	73	19,164	1,690
46	80,898	3,142	74	17,474	1,597
47	77,756	3,063	75	15,877	1,498
48	74,693	2,985	76	14,379	1,471
49	71,708	2,903	77	12,908	1,434
50	68,805	2,813	78	11,474	1,386
51	65,992	2,720	79	10,088	1,329
52	63,272	2,632	80	8,759	1,265
53	60,640	2,534	81	7,494	1,189
54	58,106	2,445	82	6,305	1,099
55	55,661	2,353	83	5,206	996
56	53,308	2,263	84	4,210	890
57	51,045	2,177	85	3,320	782
58	48,868	2,095	86	2,538	674
59	46,773	2,022	87	1,864	565
60	44,751	1,950	88	1,299	450
61	42,801	1,937	89	849	336
62	40,864	1,918	90	513	233
63	38,946	1,983	91	280	149
64	36,963	2,044	92	131	83
65	34,919	2,102	93	48	35
66	32,817	2,080	94	13	11
67	30,737	2,050	95	2	2

TABLE 57—SERVICE PENSIONERS' MORTALITY TABLE

Teachers' Retirement Fund—Men

Age	Living $l_x^{(1)}$	Dying $d_x^{(1)}$	Age	Living $l_x^{(1)}$	Dying $d_x^{(1)}$
49	71,708	2,804	74	19,046	1,667
50	68,904	2,708	75	17,379	1,621
51	66,196	2,615	76	15,758	1,574
52	63,581	2,524	77	14,184	1,518
53	61,057	2,436	78	12,666	1,459
54	58,621	2,357	79	11,207	1,399
55	56,264	2,290	80	9,808	1,332
56	53,974	2,218	81	8,476	1,269
57	51,756	2,163	82	7,207	1,187
58	49,593	2,113	83	6,020	1,096
59	47,480	2,070	84	4,924	995
60	45,410	2,034	85	3,920	884
61	43,376	1,995	86	3,045	769
62	41,381	1,970	87	2,276	646
63	39,411	1,947	88	1,630	518
64	37,464	1,933	89	1,112	398
65	35,531	1,912	90	714	288
66	33,619	1,903	91	426	194
67	31,716	1,881	92	232	119
68	29,835	1,868	93	113	65
69	27,967	1,846	94	48	31
70	26,121	1,823	95	17	12
71	24,298	1,793	96	5	4
72	22,505	1,751	97	1	1
73	20,754	1,708	..	...	...

TABLE 58—DISABILITY PENSIONERS' MORTALITY TABLE

Teachers' Retirement Fund—Women

Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$	Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$
33	100,000	2,590	69	29,791	1,787
34	97,410	2,464	70	28,004	1,773
35	94,946	2,364	71	26,231	1,760
36	92,582	2,259	72	24,471	1,747
37	90,323	2,165	73	22,724	1,725
38	88,158	2,125	74	20,999	1,701
39	86,033	2,099	75	19,298	1,671
40	83,934	2,073	76	17,627	1,639
41	81,861	2,047	77	15,988	1,599
42	79,814	2,019	78	14,389	1,554
43	77,795	1,999	79	12,835	1,495
44	75,796	1,971	80	11,340	1,429
45	73,825	1,949	81	9,911	1,358
46	71,876	1,926	82	8,553	1,268
47	69,950	1,903	83	7,285	1,169
48	68,047	1,892	84	6,116	1,055
49	66,155	1,872	85	5,061	937
50	64,283	1,864	86	4,124	821
51	62,419	1,848	87	3,303	707
52	60,571	1,829	88	2,596	594
53	58,742	1,827	89	2,002	490
54	56,915	1,821	90	1,512	398
55	55,094	1,813	91	1,114	315
56	53,281	1,812	92	799	242
57	51,469	1,801	93	557	180
58	49,668	1,803	94	377	131
59	47,865	1,805	95	246	91
60	46,060	1,806	96	155	62
61	44,254	1,810	97	93	40
62	42,444	1,812	98	53	24
63	40,632	1,820	99	29	14
64	38,812	1,813	100	15	8
65	36,999	1,806	101	7	4
66	35,193	1,805	102	3	2
67	33,388	1,800	103	1	1
68	31,588	1,797	...	...	...

TABLE 59—SERVICE PENSIONERS' MORTALITY TABLE
Teachers' Retirement Fund—Women

Age	Living $\frac{l}{s}$ (9)	Dying $\frac{d}{s}$ (9)	Age	Living $\frac{l}{s}$ (9)	Dying $\frac{d}{s}$ (9)
45	81,633	1,040	75	36,042	2,483
46	80,593	1,067	76	33,559	2,534
47	79,526	1,093	77	31,025	2,563
48	78,433	1,119	78	28,462	2,573
49	77,314	1,144	79	25,889	2,558
50	76,170	1,168	80	23,331	2,518
51	75,002	1,190	81	20,813	2,450
52	73,812	1,211	82	18,363	2,357
53	72,601	1,231	83	16,006	2,236
54	71,370	1,251	84	13,770	2,094
55	70,119	1,269	85	11,676	1,929
56	68,850	1,290	86	9,747	1,749
57	67,560	1,310	87	7,998	1,557
58	66,250	1,332	88	6,441	1,359
59	64,918	1,357	89	5,082	1,160
60	63,561	1,386	90	3,922	969
61	62,175	1,421	91	2,953	787
62	60,754	1,462	92	2,166	623
63	59,292	1,509	93	1,543	478
64	57,783	1,566	94	1,065	355
65	56,217	1,630	95	710	254
66	54,587	1,703	96	456	175
67	52,884	1,783	97	281	116
68	51,101	1,872	98	165	72
69	49,229	1,965	99	93	44
70	47,264	2,060	100	49	24
71	45,204	2,157	101	25	13
72	43,047	2,250	102	12	7
73	40,797	2,338	103	5	3
74	38,459	2,417	104	2	2

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 94. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 60—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUE OF THE PENSION BENEFITS PAYABLE TO THESE MEMBERS, BASED ON AN ENTRANCE SALARY OF \$1,000 PER ANNUM FOR MEN AND WOMEN.

Teachers' Retirement Fund

AGE AT ENTRANCE	MEN				WOMEN			
	Future Salary	Total of All Pension Benefits	Disability Pension	Service Pension	Future Salary	Total of All Pension Benefits	Disability Pension	Service Pension
20	\$36,129	\$1,246	\$145	\$1,101	\$19,668	\$1,278	\$278	\$1,000
25	28,274	1,114	122	992	18,486	1,353	208	1,145
30	22,993	1,025	104	921	17,398	1,302	112	1,190
35	19,755	945	86	859	15,370	1,109	53	1,056
40	17,363	785	54	731	12,645	832	20	812

The following table shows the expectation of life of pensioners of various ages, together with the annuity values based on the mortality tables which were used in valuing pensions:

TABLE 61—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS
Teachers' Retirement Fund—Men and Women

AGE	MEN						WOMEN					
	ANNUITY VALUE			EXPECTATION OF LIFE			ANNUITY VALUE			EXPECTATION OF LIFE		
	Disability Pen-sioners	Service Pen-sioners		Disability Pen-sioners	Service Pen-sioners		Disability Pen-sioners	Service Pen-sioners		Disability Pen-sioners	Service Pen-sioners	
40	12.07	...	19.51	13.49	...	22.81	5.81	5.97	7.02	7.26	6.33	7.82
41	11.92	...	19.12	13.35	...	22.37	5.56	5.70	6.66	6.86	6.00	7.42
42	11.78	...	18.75	13.21	...	21.93	5.29	5.43	6.27	6.47	5.80	7.03
43	11.64	...	18.39	13.06	...	21.49	5.01	5.16	5.88	6.09	5.53	6.65
44	11.51	...	18.05	12.90	...	21.04	4.72	4.88	5.49	5.71	5.27	6.28
45	11.39	...	17.72	12.74	...	20.59	4.44	4.60	5.11	5.33	5.01	5.93
46	11.27	...	17.40	12.58	...	20.14	4.16	4.32	4.75	4.96	4.76	5.58
47	11.16	...	17.09	12.41	...	19.68	3.88	4.04	4.39	4.60	4.51	5.25
48	11.04	...	16.77	12.23	...	19.21	3.61	3.76	4.05	4.24	4.27	4.94
49	10.91	...	16.44	12.05	...	18.75	3.34	3.49	3.72	3.90	4.05	4.64
50	10.79	11.00	16.12	11.86	14.07	18.28	3.08	3.22	3.39	3.57	3.83	4.37
51	10.65	10.86	15.78	11.67	13.84	17.81	2.82	2.96	3.08	3.25	3.63	4.10
52	10.51	10.72	15.44	11.47	13.59	17.34	2.56	2.70	2.77	2.95	3.43	3.86
53	10.37	10.57	15.09	11.26	13.35	16.86	2.30	2.46	2.47	2.66	3.24	3.62
54	10.21	10.41	14.72	11.05	13.09	16.39	2.05	2.23	2.18	2.39	3.06	3.39
55	10.04	10.23	14.35	10.84	12.83	15.91	1.81	2.01	1.91	2.14	2.88	3.18
56	9.86	10.05	13.96	10.62	12.56	15.44	1.59	1.80	1.66	1.90	2.71	2.86
57	9.67	9.86	13.56	10.39	12.28	14.97	1.37	1.60	1.42	1.68	2.55	2.78
58	9.46	9.66	13.14	10.16	11.99	14.49	1.16	1.41	1.19	1.48	2.39	2.60
59	9.23	9.45	12.70	9.93	11.70	14.02	.96	1.25	.98	1.29	2.25	2.42
60	8.99	9.23	12.25	9.69	11.39	13.55	.80	1.10	.81	1.13	2.10	2.26
61	8.74	9.01	11.79	9.45	11.08	13.08	.65	.96	.65	.98	1.97	2.04
62	8.47	8.77	11.33	9.20	10.76	12.62	...	.84	...	.85	1.83	1.91
63	8.20	8.54	10.86	8.95	10.43	12.16	...	.67	...	.70	1.70	1.80
64	7.94	8.29	10.41	8.70	10.10	11.70	...	...	...	...	1.58	1.66
65	7.69	8.04	9.99	8.45	9.76	11.25	...	...	...	...	1.46	1.55
66	7.45	7.79	9.60	8.19	9.42	10.80	...	...	...	...	1.33	1.43
67	7.22	7.54	9.22	7.93	9.08	10.36	...	...	...	...	1.17	1.34
68	6.99	7.28	8.84	7.67	8.73	9.92	...	...	...	...	1.04	1.22
69	6.76	7.02	8.47	7.40	8.39	9.49	...	...	...	...	.90	1.06
70	6.53	6.76	8.11	7.14	8.04	9.06	...	...	...	...	...	.83
71	6.29	6.50	7.75	6.87	7.70	8.64	...	...	...	...	...	...
72	6.06	6.24	7.39	6.60	7.37	8.23	...	...	...	...	...	...

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 62—NUMBER AND SALARIES OF ACTIVE MEMBERS' CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Teachers' Retirement Fund

AGE	MEN		WOMEN		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
18	...	...	1	\$720	20,588	\$28,890,370
19	...	...	15	10,800	20,587	28,889,650
20	4	\$3,420	167	120,440	20,572	28,878,850
21	12	11,830	458	320,830	20,401	28,754,990
22	26	23,810	811	586,930	19,931	28,413,330
23	51	49,690	962	706,750	19,094	27,802,590
24	72	76,910	907	689,580	18,081	27,046,150
25	88	99,810	979	789,560	17,102	26,279,660
26	88	111,780	874	761,080	16,035	25,390,290
27	128	182,910	774	729,200	15,073	24,516,530
28	118	180,760	781	787,000	14,171	23,604,420
29	119	207,860	702	753,080	13,272	22,636,660
30	120	217,940	743	841,080	12,451	21,674,820
31	114	218,480	652	790,320	11,588	20,615,800
32	110	214,910	641	818,080	10,822	19,607,000
33	98	201,890	529	700,520	10,071	18,573,110
34	86	187,080	580	826,580	9,444	17,670,700
35	98	215,650	538	788,930	8,778	16,657,040
36	101	229,220	540	814,980	8,142	15,652,460
37	101	246,300	515	808,400	7,501	14,608,260
38	86	211,010	586	945,850	6,885	13,553,560
39	78	188,440	476	781,560	6,213	12,396,700
40	71	183,080	478	798,410	5,659	11,426,700
41	78	205,630	424	751,500	5,110	10,445,210
42	84	225,550	400	691,620	4,608	9,488,080
43	62	158,300	337	593,930	4,124	8,570,910
44	68	183,610	360	651,110	3,725	7,818,680
45	60	165,080	314	584,840	3,297	6,983,960
46	61	166,490	285	537,380	2,923	6,234,040
47	41	115,660	247	460,020	2,577	5,530,170
48	26	84,560	233	442,750	2,289	4,954,490
49	42	128,430	220	428,050	2,030	4,427,180
50	26	75,850	174	343,510	1,768	3,870,700
51	27	87,730	176	347,250	1,568	3,451,340
52	34	110,150	131	254,130	1,365	3,016,360
53	27	84,180	144	274,740	1,200	2,643,080
54	27	85,690	165	312,680	1,029	2,284,160
55	14	44,100	126	238,950	837	1,885,790
56	21	65,550	97	198,610	697	1,602,740
57	14	48,670	84	170,920	579	1,338,580
58	17	52,900	51	102,370	481	1,118,990
59	14	41,890	56	104,170	413	963,720
60	16	48,130	49	104,570	343	817,660
61	15	57,270	57	117,500	278	664,960
62	15	46,350	32	67,460	206	490,190
63	10	36,450	22	43,640	159	376,380
64	12	40,800	32	63,500	127	296,290
65	6	17,600	19	32,510	83	191,990
66	3	9,160	13	21,460	58	141,880
67	2	4,830	9	20,360	42	111,260
68	6	19,150	5	12,400	31	86,070
69	5	15,500	5	10,970	20	54,520
70	6	16,900	4	11,150	10	28,050

TABLE 63—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Teachers' Retirement Fund

TOTAL SERVICE — YEARS	MEN		WOMEN		Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
	Number	Salaries	Number	Salaries		
0	61	\$69,190	646	\$492,640	20,588	\$28,890,370
1	90	119,660	1,191	949,950	19,881	28,328,540
2	133	170,730	1,403	1,144,680	18,600	27,258,930
3	148	199,700	817	690,940	17,004	25,943,520
4	152	236,060	1,068	983,540	16,039	25,052,880
5	130	219,300	715	714,730	14,819	23,833,280
6	120	200,930	997	1,069,610	13,974	22,890,250
7	199	370,570	1,040	1,172,250	12,857	21,628,710
8	172	344,860	942	1,088,150	11,618	20,085,890
9	153	326,340	642	776,250	10,504	18,652,880
10	109	396,090	586	762,060	9,709	17,550,290
11	155	372,660	776	1,090,580	8,954	16,392,140
12	81	202,350	587	883,990	8,023	14,928,900
13	111	289,660	762	1,163,120	7,355	13,842,560
14	91	242,810	518	828,330	6,482	12,389,780
15	103	280,370	463	743,910	5,873	11,318,640
16	145	402,700	511	861,550	5,307	10,294,360
17	64	203,250	471	817,600	4,651	9,030,110
18	47	135,000	405	682,050	4,116	8,009,260
19	39	115,410	384	660,200	3,664	7,192,210
20	38	111,510	289	505,320	3,241	6,416,600
21	17	58,850	231	407,400	2,914	5,799,770
22	22	68,010	310	548,500	2,666	5,333,520
23	21	65,900	207	379,250	2,334	4,717,010
24	15	46,420	227	400,940	2,106	4,271,860
25	14	40,310	195	354,740	1,864	3,824,500
26	18	60,650	162	311,450	1,655	3,420,450
27	24	80,250	148	283,150	1,475	3,057,350
28	7	27,050	147	260,250	1,303	2,693,950
29	14	50,270	130	253,110	1,149	2,400,650
30 & over	55	207,080	950	1,890,190	1,005	2,097,270

TABLE 64—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Teachers' Retirement Fund

AGE	MEN		WOMEN		AGE	MEN		WOMEN	
	Number	Pensions	Number	Pensions		Number	Pensions	Number	Pensions
39	..	...	3	\$2,030	60	..	...	4	\$2,320
40	..	...	..	...	61	..	...	4	2,410
41	..	...	5	2,930	62	..	...	6	4,570
42	..	...	8	5,090	63	I	\$970	3	2,270
43	..	...	13	7,910	64	..	...	3	1,810
44	..	...	11	6,280	65	..	...	5	2,850
45	..	...	15	9,850	66	..	...	4	2,830
46	..	...	16	8,670	67	..	...	3	1,590
47	I	\$840	11	6,170	68	I	610	..	...
48	..	...	19	13,240	69	..	...	..	...
49	2	2,180	15	9,090	70	I	640	I	630
50	..	...	16	10,070	71	..	...	2	1,260
51	..	...	26	16,670	72	..	...	I	630
52	..	...	13	7,840	73	..	...	..	...
53	I	1,130	14	9,550	74	..	...	I	660
54	..	...	12	6,950	75	..	...	I	1,000
55	I	1,100	11	7,350	76	..	...	I	590
56	..	...	8	5,780	77	..	...	I	680
57	..	...	5	2,940	..	..	...	..	...
58	2	2,490	12	7,130	Total	II	\$11,260	278	\$174,530
59	I	1,300	5	2,890					

TABLE 65—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

Teachers' Retirement Fund

AGE	MEN		WOMEN		AGE	MEN		WOMEN	
	Number	Pensions	Number	Pensions		Number	Pensions	Number	Pensions
48	..	...	I	\$910	71	4	4,630	39	\$30,180
49	..	...	I	910	72	4	5,160	46	36,270
50	..	...	3	3,160	73	3	4,080	33	28,380
51	..	...	13	10,900	74	5	7,000	26	19,570
52	..	...	22	18,110	75	5	6,180	27	19,910
53	I	\$1,500	23	20,400	76	3	4,900	17	12,220
54	I	1,200	26	19,810	77	5	7,700	19	13,420
55	..	...	36	27,590	78	I	1,500	13	11,300
56	I	1,200	51	42,600	79	I	1,500	8	6,820
57	..	...	46	36,220	80	2	2,300	7	5,680
58	I	1,200	48	36,000	81	3	3,660	9	7,360
59	..	...	47	34,070	82	2	2,460	3	2,130
60	2	2,700	51	39,480	83	3	9,500	3	2,900
61	2	2,530	62	46,670	84	I	1,500	I	880
62	5	6,480	65	49,080	85	..	...	..	...
63	2	2,700	51	39,310	86	..	...	..	...
64	I	1,200	50	36,990	87	..	...	..	...
65	I	800	61	47,140	88	..	...	..	...
66	4	6,400	64	48,530	89	..	...	I	600
67	..	...	42	33,410	90	..	...	2	1,510
68	3	3,900	54	40,280	91	I	1,500	..	...
69	3	4,000	48	37,210	Total	71	\$100,460	1,161	\$899,640
70	I	1,080	42	31,730					

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets shows the complete financial condition of the fund as of that date:

**TABLE 66—A VALUATION OF ASSETS AND LIABILITIES
AS OF**

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 1,521 Pensioners now on the pension roll of the fund, as follows:	
Service Pensioners:	
71 Men on annual pensions aggregating.....\$100,460	\$614,610
1,161 Women on annual pensions aggregating..... 899,640	8,879,450
Disability Pensioners:	
11 Men on annual pensions aggregating..... 11,260	107,850
278 Women on annual pensions aggregating..... 174,530	1,979,300
Total Pensions Entered Upon.....	\$11,581,210
Pensions to such Members as will retire from the present force of 20,588 members:	
Service Pensions:	
Men.....	\$6,591,750
Women.....	43,051,025
Disability Pensions:	
Men.....	730,350
Women.....	7,855,425
Total Pensions Not Entered Upon.....	\$58,228,550
Grand Total.....	\$69,809,760

and liabilities of the Teachers' Retirement Fund as of June 30, 1914, and

**OF THE TEACHERS' RETIREMENT FUND—VALUED
JUNE 30, 1914**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand creditable to	
Men.....	\$174,590
Women.....	708,125
Contribution of One Percentum of Future Salaries by Employees:	
Men.....	1,000,125
Women.....	3,183,600
*Deficiency creditable to	
Men.....	6,944,335
Women.....	57,798,985
Grand Total.....	\$69,809,760

*NOTE—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however will probably be less than \$10,000,000.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 67—THE AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Teachers' Retirement Fund

YEAR AFTER VALUA- TION	*Date	DISABILITY PENSIONS		SERVICE PENSIONS		Total	YEAR AFTER VALUA- TION	*Date	DISABILITY PENSIONS		SERVICE PENSIONS		Total
		Men	Women	Men	Women				Men	Women	Men	Women	
0	1914	\$10,978	\$171,432	\$95,122	\$882,164	\$1,159,696	31	1945	\$518	\$22,795	\$277	\$34,998	\$58,588
1	1915	10,469	165,720	85,642	849,512	1,111,343	32	1946	420	19,972	194	27,839	48,425
2	1916	9,965	160,953	76,826	816,194	1,063,938	33	1947	334	17,359	132	21,842	39,667
3	1917	9,484	154,322	68,636	782,233	1,014,875	34	1948	263	14,961	87	16,884	32,195
4	1918	9,006	148,816	61,044	747,693	966,559	35	1949	204	12,776	55	12,841	25,876
5	1919	8,539	143,228	54,034	712,658	918,459	36	1950	154	10,803	33	9,601	20,591
6	1920	8,078	137,710	47,599	677,215	870,602	37	1951	115	9,043	19	7,051	16,228
7	1921	7,622	132,213	41,735	641,488	823,058	38	1952	83	7,488	10	5,075	12,656
8	1922	7,182	126,751	36,431	605,544	775,908	39	1953	57	6,130	5	3,573	9,765
9	1923	6,741	121,331	31,663	569,573	729,308	40	1954	38	4,954	2	2,458	7,452
10	1924	6,310	115,952	27,402	533,716	683,380	41	1955	23	3,954	1	1,050	5,028
11	1925	5,891	110,616	23,614	498,073	638,194	42	1956	13	3,113	...	1,078	4,204
12	1926	5,480	105,332	20,263	462,870	593,954	43	1957	7	2,415	...	683	3,105
13	1927	5,098	100,101	17,306	428,242	550,747	44	1958	3	1,845	...	417	2,265
14	1928	4,705	94,926	14,712	394,356	508,699	45	1959	1	1,386	...	243	1,630
15	1929	4,335	89,817	12,450	361,369	467,971	46	1960	...	1,023	...	137	1,160
16	1930	3,980	84,776	10,489	329,430	428,075	47	1961	...	742	...	78	820
17	1931	3,634	79,811	8,801	298,691	399,937	48	1962	...	528	...	20	557
18	1932	3,309	74,924	7,352	269,275	354,860	49	1963	...	367	...	16	383
19	1933	2,989	70,031	6,109	241,306	320,435	50	1964	...	742	...	9	250
20	1934	2,690	65,433	5,045	214,882	288,950	51	1965	...	166	...	1	167
21	1935	2,409	60,843	4,135	190,064	257,451	52	1966	...	106	...	...	106
22	1936	2,149	56,370	3,367	166,955	228,841	53	1967	...	66	...	...	66
23	1937	1,895	52,023	2,701	145,565	202,184	54	1968	...	39	...	...	39
24	1938	1,665	47,863	2,145	125,904	177,517	55	1969	...	23	...	...	23
25	1939	1,450	43,728	1,678	108,016	154,872	56	1970	...	13	...	...	13
26	1940	1,252	39,805	1,205	91,845	134,197	57	1971	...	7	...	...	7
27	1941	1,073	36,044	984	77,363	115,464	58	1972	...	4	...	...	4
28	1942	911	32,453	735	64,527	98,626	59	1973	...	1	...	...	1
29	1943	763	29,046	541	53,206	83,556	Totals		\$152,928	\$3,019,758	\$771,062	\$12,529,858	\$16,473,606
30	1944	634	25,819	391	43,426	70,270							

*Date Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund, expressed as a percentage of the employee's salary:

TABLE 68—THE RATES OF CONTRIBUTION, EXPRESSED AS PERCENTAGES OF SALARIES, NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE TEACHERS' RETIREMENT FUND

AGE AT ENTRANCE	MEN			WOMEN		
	Total	Disability Pension	Service Pension	Total	Disability Pension	Service Pension
20	3.45	.40	3.05	6.49	1.41	5.08
21	3.54	.41	3.13	6.71	1.40	5.31
22	3.64	.42	3.22	6.90	1.36	5.54
23	3.73	.42	3.31	7.06	1.30	5.76
24	3.83	.43	3.40	7.17	1.22	5.95
25	3.93	.43	3.50	7.25	1.13	6.12
26	4.04	.44	3.60	7.30	1.03	6.27
27	4.13	.44	3.69	7.32	.93	6.39
28	4.24	.45	3.79	7.30	.83	6.47
29	4.33	.45	3.88	7.25	.73	6.52
30	4.41	.45	3.96	7.18	.64	6.54
31	4.49	.45	4.04	7.09	.57	6.52
32	4.56	.46	4.10	6.98	.51	6.47
33	4.61	.45	4.16	6.85	.45	6.40
34	4.64	.45	4.19	6.69	.40	6.29
35	4.63	.43	4.20	6.51	.35	6.16
36	4.61	.42	4.19	6.30	.30	6.00
37	4.56	.40	4.16	5.89	.26	5.63
38	4.47	.37	4.10	5.84	.23	5.61
39	4.34	.34	4.00	5.59	.19	5.40
40	4.20	.31	3.89	5.32	.16	5.16

HEALTH DEPARTMENT PENSION FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Health Department Pension Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

TO EMPLOYEES

- (1) Upon application after 20 years' service, a pension not to exceed one-half final salary of employee of same grade.

The average allowance has been about 49 per cent. of final salary.

- (2) Upon disability incurred in the actual performance of duty, pensions of one-fourth to one-half final salary.

The average allowance has been about 47 per cent. of final salary.

- (3) Upon disability resulting from causes not connected with the actual performance of duty, and incurred after 20 years of service, a pension not to exceed one-half final salary of employee of same grade.

No pension in the past has been granted under this benefit. This valuation is based upon an allowance of 50 per cent. of final salary.

Pensions to employees disabled in actual performance of duty are revocable. Pensions to employees after 20 years' service are not revocable.

TO WIDOWS OF EMPLOYEES

- (4) Upon death of an employee from injuries sustained or disease contracted in actual performance of duty, a pension of \$300 per annum.

Pensions to widows are terminated automatically by death or remarriage and are subject to revocation.

TO CHILDREN OF EMPLOYEES

- (5) Upon death of an employee from injuries sustained or disease contracted in actual performance of duty, if there be no widow's pension; otherwise upon termination of widow's pension, a pension of \$300 per annum.

Pensions to children are terminated by death, marriage, attainment of age 18, or revocation.

TO DEPENDENT PARENTS OF EMPLOYEES

- (6) Upon death of an employee from injuries sustained or disease contracted in actual performance of duty, a pension of \$300 per annum to widowed mother.

Pensions to widowed mothers cease on remarriage and are subject to revocation.

Contributions**BY EMPLOYEES**

One per cent. of salaries.

BY CITY***Indirect contributions:***

Miscellaneous revenues, such as moneys collected from fines and penalties for violation of the sanitary code.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305, of this report.

BASIC DATA AND THEIR DEVELOPMENT**Schedules included**

The Health Department Pension Fund includes all physicians and other employees who have filed with the comptroller consent that deductions from their salaries be made for the support of the fund. The schedules representing all physicians and other employees were therefore divided according to the payroll of June 30, 1914, into those for contributors and those for non-contributors. The former class only is considered in this section of the report. The schedules for the latter class were further subdivided and included under the various divisions of the City of New York Employees' Retirement Fund.

The fact that Health Department employees who contribute to the Health Department Pension Fund are pensioned from that fund, whereas those who do not contribute are pensioned from the City of New York Employees' Retirement Fund was not always clearly understood by the Health Department employees themselves, and some of them in filling out the schedules for the Commission on Pensions reported themselves as pensionable from the Health Department fund, whereas actually they were pensionable from the City of New York Employees' Retirement Fund. That such a misunderstanding had existed was not discovered until the experience tables had been tabulated and the rates were being prepared. Resort was had to the payrolls of the Health Department as of June, 1914,

and the names secured of all employees who actually contributed to the Health Department fund. By use of this list the schedules of the Commission were corrected. The question then arose as to the necessity and advisability of retabulating the experience tables and reworking the rates. Investigation was therefore made to determine to what extent the changes would affect the rates derived from the original tabulation. It was found that in the table for men, which is the principal one employed, the number in active service would be reduced by 140 and that 102 of the 140 had had less than five years' service, and that all were distributed over the ages in about the same proportions as the remaining active members. The effect of their inclusion was to increase the exposed to risk column and—since the out of service cards are correct, having been secured from the records in the first instance—to give lower rates of separation, especially in the select years. If the rates of resignation and dismissal had been recomputed on the reduced exposure resulting from the exclusion of the schedules for these employees, they would have been very high and, before they were used, would have been reduced to make them somewhat more conservative. The exaggerated exposure accidentally used had resulted in a reduction of less than 15% in all the rates derived by its use. Since the rates of disability and of service retirement for the service were adopted rates, as is explained later in this section of the report, they were in no way affected by this difference in the exposure. Because of these conditions the use of the first tabulation was considered satisfactory. The rates were of course applied to the corrected figures in the remaining processes of the valuation.

Special methods of handling data

The schedules for men and women members were separated and tabulations were made in the general form showing for each sex the number of separations from service occurring in the six-year period of experience. These tabulations indicated such a high total rate of separation from active service that it was apparent that the rates could not be satisfactorily employed in the construction of an aggregate service table. Tabulations of the experience were then made in a select form in which the number of separations from service during the first three years of service were tabulated separately by years and only separations from service occurring after the third year were combined. The gross rate of separation was accordingly reduced approximately for men from 20% in the first year of service to 6% after three completed years of service; for women from 22% in the first year of service to 6% after three completed years of service.

The table on page 125 shows, for the active service, the extent of the exposure used and the number of separations, classified by cause, occurring in the first three years of service and after three completed years of service.

Of the total number of separations occurring in the first year of service resignations formed 98.4% among the men and 95.3% among the women. Of the total separations occurring after three completed years of service resignations formed only 56.0% among the men and 86.7% among the women. The separations from each of the other causes, however, do not show a marked variation with years of service. It was assumed, therefore, that the rate of resignation only was primarily affected by years of service

TABLE 69—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Health Department Pension Fund

YEARS OF SERVICE	Exposed to Risk	WITHDRAWALS			DEATHS			SEPARATIONS BY DISABILITY			Service Retirements	Total Separations
		Resignations	Dismissals	Total	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total		
Men												
One.....	613.5	123	1	124	..	1	1	..	..	..	..	125
Two.....	537.5	54	1	55	..	1	1	..	..	..	..	56
Three.....	532.0	40	4	44	..	1	1	..	..	..	..	45
Ultimate.....	4,437.0	149	17	166	..	41	41	5	..	5	54	266
Total.....	6,120.0	366	23	389	..	44	44	5	..	5	54	492
Women												
One.....	580.5	122	6	128	..	..	..	..	..	..	..	128
Two.....	459.0	56	1	57	..	..	..	..	..	..	..	57
Three.....	381.5	44	2	46	..	..	..	..	..	..	..	46
Ultimate.....	1,741.0	85	2	87	..	9	9	..	..	..	2	98
Total.....	3,162.0	307	11	318	..	9	9	..	..	..	2	329

and that select rates of resignation should be graduated directly from the data, while other select rates of separation could be obtained from ultimate rates by the use of the method previously described on page 29.

The tabulations showed marked differences between the men and the women in respect to the rates of separation from the service in the first three years after entrance. Tables on a select basis for the first three years of service were therefore prepared treating men and women separately. A comparison between roughly graduated rates based on the ultimate experience of men and women combined and similar rates based on the ultimate experience of men alone indicated that combining the experience of women with that of men tended to increase the rate of dismissal. The total ultimate rates of withdrawal from men and women combined were not materially different from those for men alone, and as the number of women included in the active service is small and cannot be assumed to bear always the same ratio to the total number of employees as it bears in the experience used, it seemed advisable to use the experience for men as a basis for ultimate rates for the entire service.

Although tabulations of salaries were made for men and women as a basis for salary scales, according to the general method outlined in section I, page 31, they were used in a method somewhat different from the method employed in the other funds. The following table gives a summary of the experience which was available:

TABLE 70—SUMMARY OF EXPOSURE—SALARY
Health Department Pension Fund

Class	Number of Annual Salaries	Total Payroll
Active Members:		
Men	4,361	\$4,686,930
Women	2,328	1,827,860
Pensioned Members:		
Men	147	249,220
Women	3	27,000
Total	6,839	\$6,791,010

The salary curve or salary scale for men, which was roughly graduated from the salaries of active members alone, is very much lower in the later ages than the corresponding curve for pensioned members. A comparison between the salary scale based on the salaries of active and pensioned members combined, with a scale based on salaries received by pensioners alone prior to retirement shows, furthermore, that the salaries drawn by pensioners previous to retirement are in excess of those drawn by active members at the corresponding ages. These facts would seem to indicate that the members who retire belong generally to the high salaried class. That allowance for this condition might be made, all future contributions were valued by the salary scale formed from the salaries of active service and pensioned members combined, while the present values of all benefits were based upon the salary scale derived from the salaries of pensioned members. This procedure, therefore, called for the final graduation of the two salary scales, which accounts for the publication of two scales instead of the customary single scale in connection with the active service table.

Because of the paucity of data no scale of salaries for women employees could be prepared which would correspond to the one for men based on the salaries of pensioners prior to retirement. The salary scale for the women members of the active force is, therefore, the only one which can be considered, even though the apparent selection of high salaried members for retirement may be assumed to affect the women as well as the men. The tabulations covering active members showed that the salaries of women were generally lower than those for men, but the salary scale for women has much the same form as that for men. Since the salary scale is employed simply to show ratios of increase in salaries and not the probable actual salaries, it was thought advisable to use the salary scales based on the salaries of men rather than to prepare a new scale for women.

The experience regarding pensioners was used in accordance with the general methods employed in all funds, consequently it is presented in the following summary without comment:

**TABLE 71—SUMMARY OF EXPOSURE AND SEPARATIONS—
EMPLOYEE PENSIONERS**

Health Department Pension Fund

Class	Exposed to Risk	Deaths
Disability Pensioners.....	44	2
Service Pensioners.....	240	4
Total.....	284	6

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation thereof.

Rates developed on a select basis are compared first with rates developed on the same basis and then with aggregate rates. In order to make comparison with aggregate rates the select and ultimate rates have been respectively multiplied into a standard service exposure, which has been subdivided by years of service, and the expected cases of separation obtained in this way have been contrasted with the cases obtained by use of the comparative aggregate rate and the same exposure. This method is explained in detail on pages 392 and 393.

The active service

The following tables show the rates used in constructing the active service table. Separate rates were used for men and women with less than three years' service. The ultimate rates are the same for both men and women and apply to all employees with three completed years of service. To visualize the increases and decreases in these rates from age to age and to show their relative importance at various ages, diagrams showing the rates plotted on cross section paper are given on pages 134 to 139.

TABLE 72—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Health Department Pension Fund—Men

AGE	RATES OF DEATH				RATES OF DISABILITY					RATE OF SERVICE RETIREMENT ${}_0q_x^{(a)}$
	Not in Performance of Duty			Total Ultimate $d q_x^{(a)}$	In Performance of Duty			Not in Performance of Duty ${}_0q_x^{(a)}$	Total Ultimate ${}_1q_x^{(a)}$	
	${}_0q_x^{(a)}$	${}_0q_{[x-1]+1}^{(a)}$	${}_0q_{[x-1]+s}^{(a)}$		${}_0q_x^{(a)}$	${}_1q_{[x-1]+1}^{(a)}$	${}_1q_{[x-1]+s}^{(a)}$			
15	.0018	...	...	...	.0001	...	...	...	...	...
16	.0018	.0019	...	...	.0002	.0002	...	...	...	...
17	.0018	.0019	.0020	...	.0002	.0002	.0002	...	...	...
18	.0019	.0020	.0020	.0021	.0002	.0002	.0002	.0002	.0002	.0002
19	.0020	.0020	.0021	.0022	.0002	.0002	.0002	.0002	.0002	.0002
20	.0020	.0021	.0022	.0023	.0002	.0003	.0003	.0003	.0003	.0003
21	.0021	.0022	.0023	.0024	.0003	.0003	.0003	.0003	.0003	.0003
22	.0021	.0023	.0024	.0026	.0003	.0003	.0003	.0003	.0003	.0003
23	.0021	.0024	.0025	.0026	.0003	.0003	.0004	.0004	.0004	.0004
24	.0021	.0025	.0026	.0028	.0003	.0004	.0004	.0004	.0004	.0004
25	.0021	.0026	.0028	.0029	.0003	.0004	.0004	.0005	.0005	.0005
26	.0021	.0027	.0029	.0030	.0004	.0004	.0005	.0005	.0005	.0005
27	.0022	.0028	.0030	.0032	.0004	.0005	.0005	.0006	.0006	.0006
28	.0023	.0030	.0032	.0034	.0004	.0005	.0006	.0006	.0006	.0006
29	.0024	.0031	.0033	.0036	.0005	.0006	.0006	.0007	.0007	.0007
30	.0024	.0032	.0035	.0037	.0005	.0006	.0007	.0007	.0007	.0007
31	.0025	.0033	.0036	.0038	.0005	.0007	.0008	.0008	.0008	.0008
32	.0025	.0033	.0036	.0038	.0006	.0007	.0008	.0009	.0009	.0009
33	.0025	.0033	.0036	.0039	.0006	.0008	.0009	.0009	.0009	.0009
34	.0026	.0034	.0038	.0041	.0006	.0008	.0009	.0010	.0010	.0010
35	.0028	.0036	.0040	.0043	.0007	.0009	.0010	.0010	.0010	.0010
36	.0029	.0039	.0046	.0045	.0007	.0009	.0010	.0011	.0011	.0011
37	.0032	.0041	.0046	.0049	.0007	.0010	.0011	.0011	.0011	.0011
38	.0035	.0045	.0049	.0052	.0008	.0010	.0011	.0012	.0012	.0012
39	.0037	.0048	.0053	.0056	.0008	.0010	.0011	.0012	.0012	.0012
40	.0041	.0052	.0057	.0060	.0008	.0011	.0012	.0012	.0012	.0012
41	...	.0057	.0062	.0065	...	.0011	.0012	.0012	.0012	.0012
42	...	...	.0067	.0070	...	...	.0012	.0013	.0013	.0013
43	...	...	...	.0075	...	...	...	.0013	.0013	.0013
44	...	...	...	.0081	...	...	...	.0013	.0013	.0013
45	...	...	...	.0089	...	...	...	.0013	.0013	.0013
46	...	...	...	.0095	...	...	...	.0014	.0014	.0014
47	...	...	...	.0103	...	...	...	.0015	.0015	.0015
48	...	...	...	.0111	...	...	...	.0015	.0015	.0015
49	...	...	...	.0120	...	...	...	.0015	.0016	.0016
50	...	...	...	.0130	...	...	...	.0016	.0017	.0017

TABLE 72—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Health Department Pension Fund—Men

AGE	RATES OF DEATH				RATES OF DISABILITY				RATE OF SERVICE RETIREMENT ${}^{\circ}r_q^{\circ}$		
	Not in Performance of Duty			Total Ultimate ${}^{\circ}q^{\circ}$	In Performance of Duty			Not in Performance of Duty ${}^{\circ}tr_q^{\circ}$		Total Ultimate ${}^{\circ}r_q^{\circ}$	
	${}^{\circ}d_q^{(s)}$	${}^{\circ}d_q^{(s)}_{[s-1]+1}$	${}^{\circ}d_q^{(s)}_{[s-2]+2}$		${}^{\circ}tr_q^{(s)}$	${}^{\circ}tr_q^{(s)}_{[s-1]+1}$	${}^{\circ}tr_q^{(s)}_{[s-2]+2}$				
510147	...	...	.0016	.0003	.0319	.0311	
520150	...	...	.0155	.0005	.0005	.0321	.0338
530160	...	...	.0164	.0008	.0016	.0024	.0365
540169	...	...	.0173	.0013	.0015	.0028	.0391
550179	...	...	.0182	.0019	.0015	.0034	.0419
560189	...	...	.0192	.0027	.0014	.0041	.0450
570198	...	...	.0201	.0036	.0012	.0048	.0480
580206	...	...	.0208	.0045	.0009	.0054	.0510
590211	...	...	.0213	.0056	.0005	.0061	.0541
600216	...	...	.0218	.0065	.0003	.0068	.0575
610220	...	...	.0222	.0072	.0002	.0074	.0612
620223	...	...	.0225	.0076	.0001	.0077	.0650
630227	...	...	.0228	.0079	.0001	.0080	.0690
640231	...	...	.0232	.0082	...	.0082	.0735
650233	...	...	.0234	.0083	...	.0083	.0782
660237	...	...	.0238	.0083	...	.0083	.0840
670240	...	...	.0241	.0082	...	.0082	.0900
680244	...	...	.0245	.0077	...	.0077	.0971
690249	...	...	.0250	.0069	...	.0069	.1057
700255	...	...	.0256	.0060	...	.0060	.1157
710262	...	...	.0263	.0050	...	.0050	.1285
720271	...	...	.0272	.0043	...	.0043	.1440
730284	...	...	.0284	.0036	...	.0036	.1640
740298	...	...	.0298	.0031	...	.0031	.1900
750316	...	...	.0316	.0026	...	.0026	.2260
760339	...	...	.0339	.0021	...	.0021	.2720
770366	...	...	.0366	.0017	...	.0017	.3230
780400	...	...	.0400	.0014	...	.0014	.3730
790448	...	...	.0448	.0010	...	.0010	.4210
800507	...	...	.0507	.0007	...	.0007	.4740
810600	...	...	.0600	.0003	...	.0003	.5330
820750	...	...	.0750	...	...	...	.5910
831145	...	...	.1145	...	...	...	.6460
841970	...	...	.1970	...	...	...	.7000
852650	...	...	.2650	...	...	...	.7450

TABLE 73—RATES OF SEPARATION FROM ACTIVE SERVICE
Health Department Pension Fund—Women

AGE	RATES OF WITHDRAWAL						RATES OF DEATH			
	RESIGNATION			DISMISSAL			IN PERFORMANCE OF DUTY			
	${}^r w q_{[x]}^{(a)}$	${}^r w q_{[x-1]+1}^{(a)}$	${}^r w q_{[x-2]+2}^{(a)}$	${}^d w q_{[x]}^{(a)}$	${}^d w q_{[x-1]+1}^{(a)}$	${}^d w q_{[x-2]+2}^{(a)}$	${}^a q_{[x]}^{(a)}$	${}^a q_{[x-1]+1}^{(a)}$	${}^a q_{[x-2]+2}^{(a)}$	${}^a q_x^{(a)}$
15	.0343	...	...	.0179	...	...	...	...	...	...
16	.0352	.0293	...	.0175	.0181	...	...	...	...	...
17	.0400	.0320	.0099	.0108	.0175	.0180	...	...	...	...
18	.0470	.0345	.0150	.0158	.0165	.0171	...	...	...	...
19	.0500	.0395	.0225	.0146	.0152	.0157	...	...	...	...
20	.0600	.0450	.0300	.0170	.0138	.0143	...	...	...	...
21	.0860	.0507	.0380	.0115	.0124	.0128	...	...	...	...
22	.1003	.0580	.0470	.0101	.0110	.0115	.0001	...	...	...
23	.1100	.0680	.0595	.0087	.0098	.0103	.0001	.0001	.0001	.0001
24	.1322	.0865	.0740	.0076	.0086	.0096	.0001	.0001	.0001	.0001
25	.1490	.1000	.0880	.0066	.0077	.0084	.0001	.0001	.0001	.0001
26	.1680	.1260	.1000	.0058	.0068	.0076	.0002	.0002	.0002	.0002
27	.1873	.1380	.1100	.0051	.0062	.0069	.0002	.0002	.0002	.0002
28	.2000	.1460	.1185	.0046	.0056	.0063	.0002	.0002	.0003	.0003
29	.2240	.1520	.1250	.0041	.0051	.0058	.0002	.0003	.0003	.0003
30	.2360	.1560	.1305	.0037	.0047	.0054	.0003	.0004	.0004	.0004
31	.2460	.1595	.1350	.0034	.0043	.0050	.0005	.0005	.0005	.0005
32	.2530	.1615	.1390	.0031	.0040	.0046	.0005	.0007	.0008	.0009
33	.2580	.1627	.1420	.0029	.0037	.0043	.0007	.0009	.0010	.0011
34	.2610	.1628	.1435	.0027	.0035	.0040	.0008	.0010	.0011	.0012
35	.2630	.1620	.1445	.0025	.0033	.0037	.0008	.0010	.0012	.0013
36	.2620	.1610	.1447	.0024	.0031	.0035	.0009	.0011	.0012	.0014
37	.2590	.1590	.1438	.0023	.0029	.0033	.0009	.0011	.0013	.0014
38	.2550	.1555	.1420	.0022	.0027	.0031	.0009	.0012	.0013	.0015
39	.2470	.1517	.1390	.0021	.0026	.0029	.0010	.0012	.0014	.0015
40	.2380	.1465	.1340	.0020	.0025	.0028	.0010	.0012	.0014	.0015
41	...	.1400	.1280	...	.0024	.0026	...	.0013	.0014	.0015
42	...	...	.1190	...	...	.0025	...	...	.0014	.0015
43	...	...	...	...	...	...	...	...	...	.0015
44	...	...	...	...	...	.0023	...	...	...	.0015
45	...	...	...	...	...	.0022	...	...	...	.0014
46	...	...	...	...	...	.0021	...	...	...	.0014
47	...	...	...	...	...	.0020	...	...	...	.0013
48	...	...	...	...	...	.0018	...	...	...	.0012
49	...	...	...	...	...	.0017	...	...	...	.0011
50	...	...	...	...	...	.0016	...	...	...	.0009

TABLE 73—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Health Department Pension Fund—Women

AGE	RATES OF DEATH					RATES OF DISABILITY					Rate of Service Retirement $e_r q_x^{(a)}$	
	NOT IN PERFORMANCE OF DUTY				Total Ultimate $d q_x^{(a)}$	IN PERFORMANCE OF DUTY			Not in Performance of Duty $e_r q_x^{(a)}$	Total Ultimate $\therefore q_x^{(a)}$		
	$e_d q_x^{(a)}$	$e_d q_{[x-1]+1}^{(a)}$	$e_d q_{[x-2]+2}^{(a)}$	$e_d q_x^{(a)}$		$e_r q_x^{(a)}$	$e_r q_{[x-1]+1}^{(a)}$	$e_r q_{[x-2]+2}^{(a)}$				$e_r q_x^{(a)}$
15	.0018	...	...	...	...	.0001	...	...	...	...	...
16	.0018	.0019	...	...	...	.0002	.0002	...	...	...	...
17	.0019	.0019	.0020	...	...	.0002	.0002	.0002	...	...	...
18	.0019	.0020	.0021	.0021	.0021	.0002	.0002	.0002	.0002	.0002	.0002	
19	.0020	.0021	.0022	.0022	.0022	.0002	.0002	.0002	.0002	.0002	.0002	
20	.0021	.0022	.0023	.0023	.0023	.0002	.0003	.0003	.0003	.0003	.0003	
21	.0021	.0023	.0024	.0024	.0024	.0003	.0003	.0003	.0003	.0003	.0003	
22	.0022	.0024	.0025	.0026	.0026	.0003	.0003	.0003	.0003	.0003	.0003	
23	.0022	.0024	.0025	.0026	.0027	.0003	.0003	.0004	.0004	.0004	.0004	
24	.0022	.0025	.0026	.0028	.0029	.0003	.0004	.0004	.0004	.0004	.0004	
25	.0022	.0025	.0027	.0029	.0030	.0003	.0004	.0004	.0005	.0005	.0005	
26	.0022	.0026	.0029	.0030	.0032	.0004	.0004	.0005	.0005	.0005	.0005	
27	.0022	.0027	.0030	.0032	.0034	.0004	.0005	.0005	.0006	.0006	.0006	
28	.0023	.0028	.0031	.0034	.0037	.0004	.0005	.0006	.0006	.0006	.0006	
29	.0023	.0029	.0032	.0036	.0039	.0004	.0005	.0006	.0007	.0007	.0007	
30	.0023	.0030	.0033	.0037	.0041	.0005	.0006	.0007	.0007	.0007	.0007	
31	.0023	.0030	.0034	.0038	.0044	.0005	.0006	.0007	.0008	.0008	.0008	
32	.0023	.0030	.0034	.0038	.0047	.0005	.0007	.0008	.0009	.0009	.0009	
33	.0024	.0030	.0035	.0039	.0050	.0006	.0007	.0008	.0009	.0009	.0009	
34	.0025	.0032	.0036	.0041	.0053	.0006	.0008	.0009	.0010	.0010	.0010	
35	.0026	.0034	.0038	.0043	.0056	.0006	.0008	.0009	.0010	.0010	.0010	
36	.0028	.0036	.0041	.0045	.0059	.0007	.0008	.0010	.0011	.0011	.0011	
37	.0030	.0039	.0044	.0049	.0063	.0007	.0009	.0010	.0011	.0011	.0011	
38	.0033	.0042	.0047	.0052	.0067	.0007	.0009	.0010	.0012	.0012	.0012	
39	.0036	.0045	.0050	.0056	.0071	.0008	.0010	.0011	.0012	.0012	.0012	
40	.0041	.0050	.0055	.0060	.0075	.0008	.0010	.0011	.0012	.0012	.0012	
41	...	.0057	.0060	.0065	.0080	...	.0010	.0011	.0012	.0012	.0012
42	...	...	.0068	.0070	.0085	...	...	.0012	.0013	.0013	.0013
43	...	...	...	.0075	.0090	...	...	.0013	.0013	.0013	.0013
44	...	...	...	.0081	.0096	...	...	...	.0013	.0013	.0013
45	...	...	...	.0089	.0103	...	...	...	.0013	.0013	.0013
46	...	...	...	.0095	.0109	...	...	...	.0014	.0014	.0014
47	...	...	...	.0103	.0116	...	...	...	.0015	.0015	.0015
48	...	...	...	.0111	.0123	...	...	...	.0015	.0015	.0015
49	...	...	...	.0120	.0131	...	...	...	.0015	.0015	.0015
50	...	...	...	.0130	.0139	...	...	...	.0016	.0016	.0017

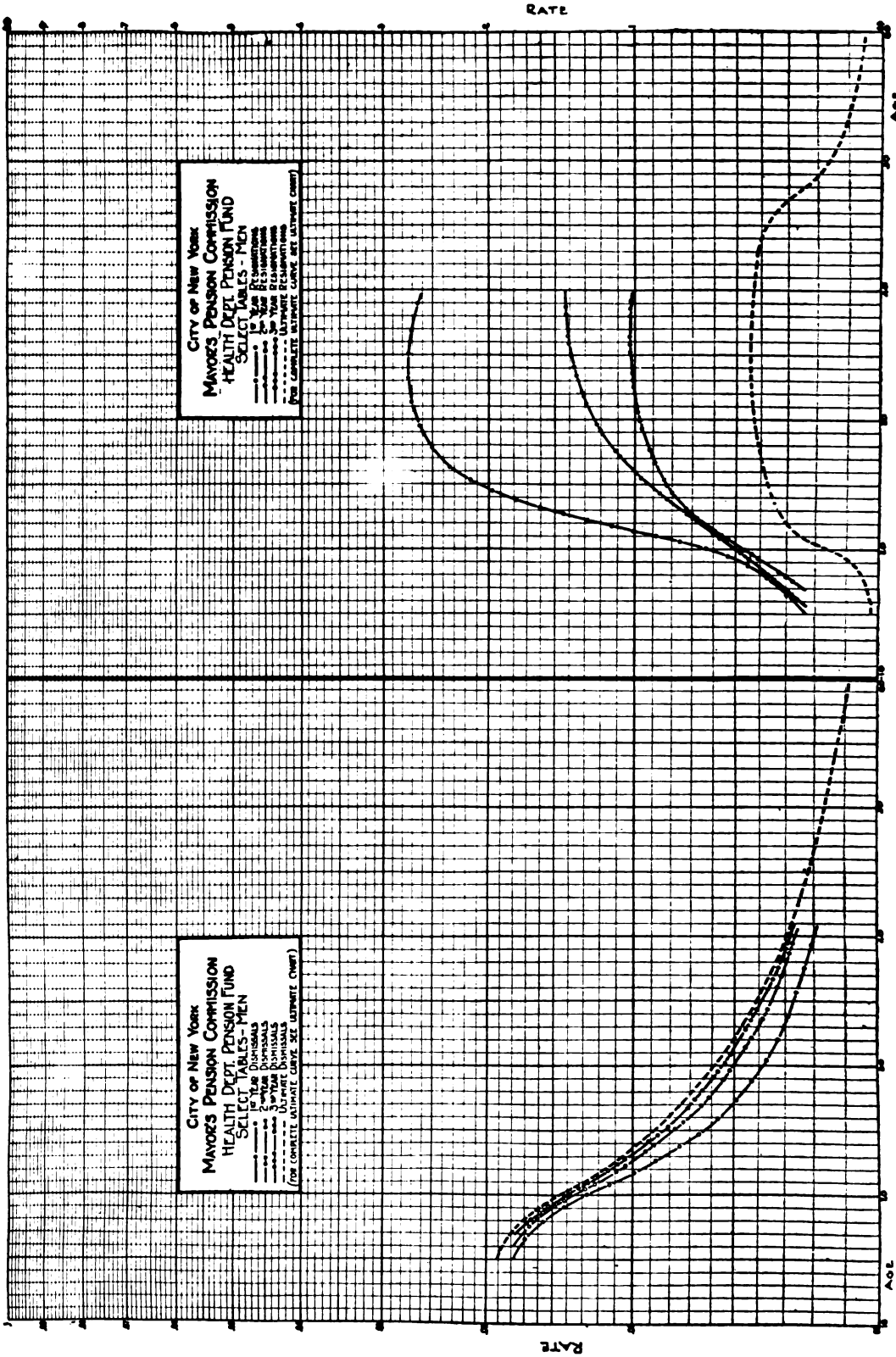
TABLE 73—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued

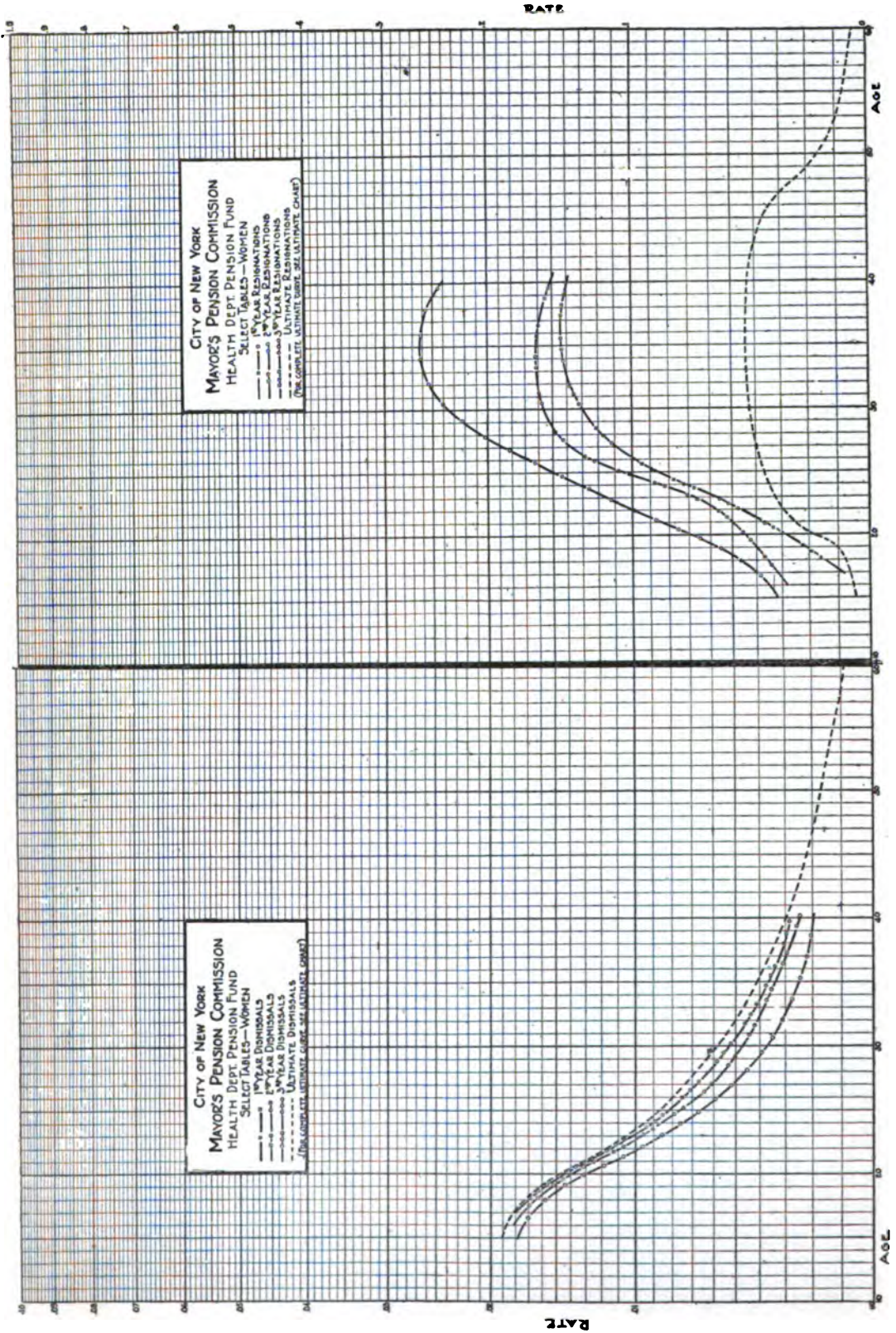
Health Department Pension Fund—Women

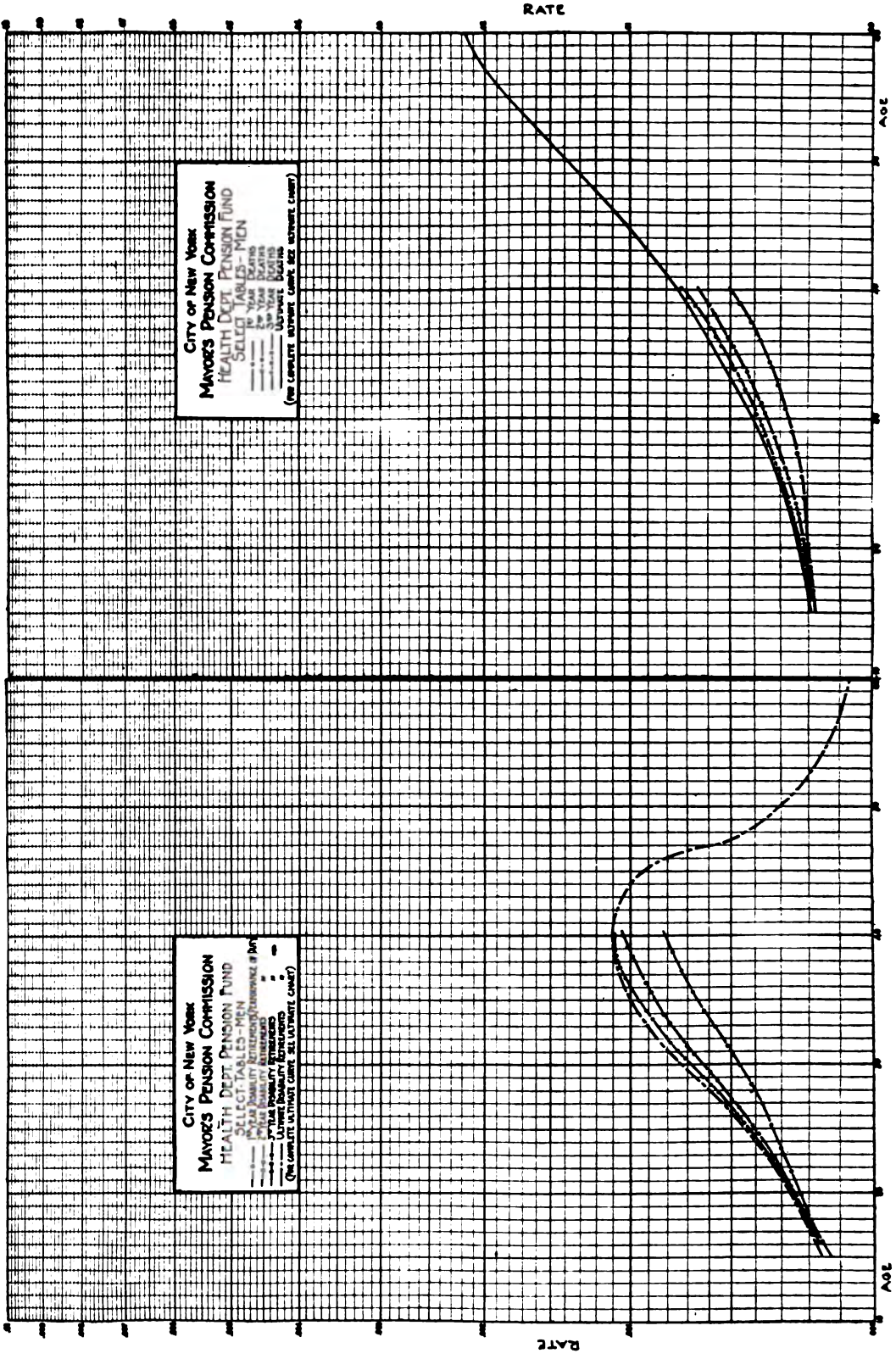
HEALTH OFFICERS AND EMPLOYEES

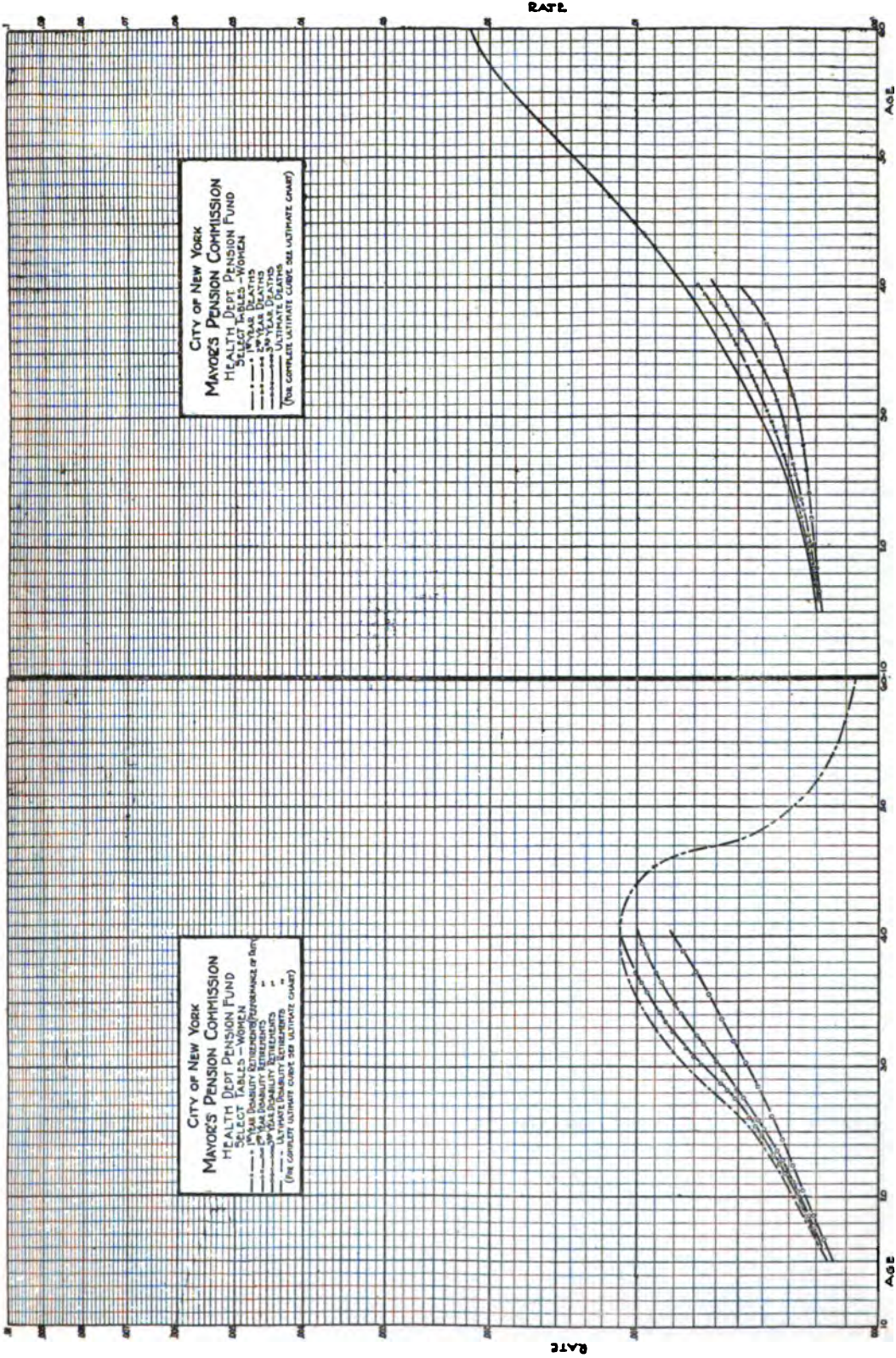
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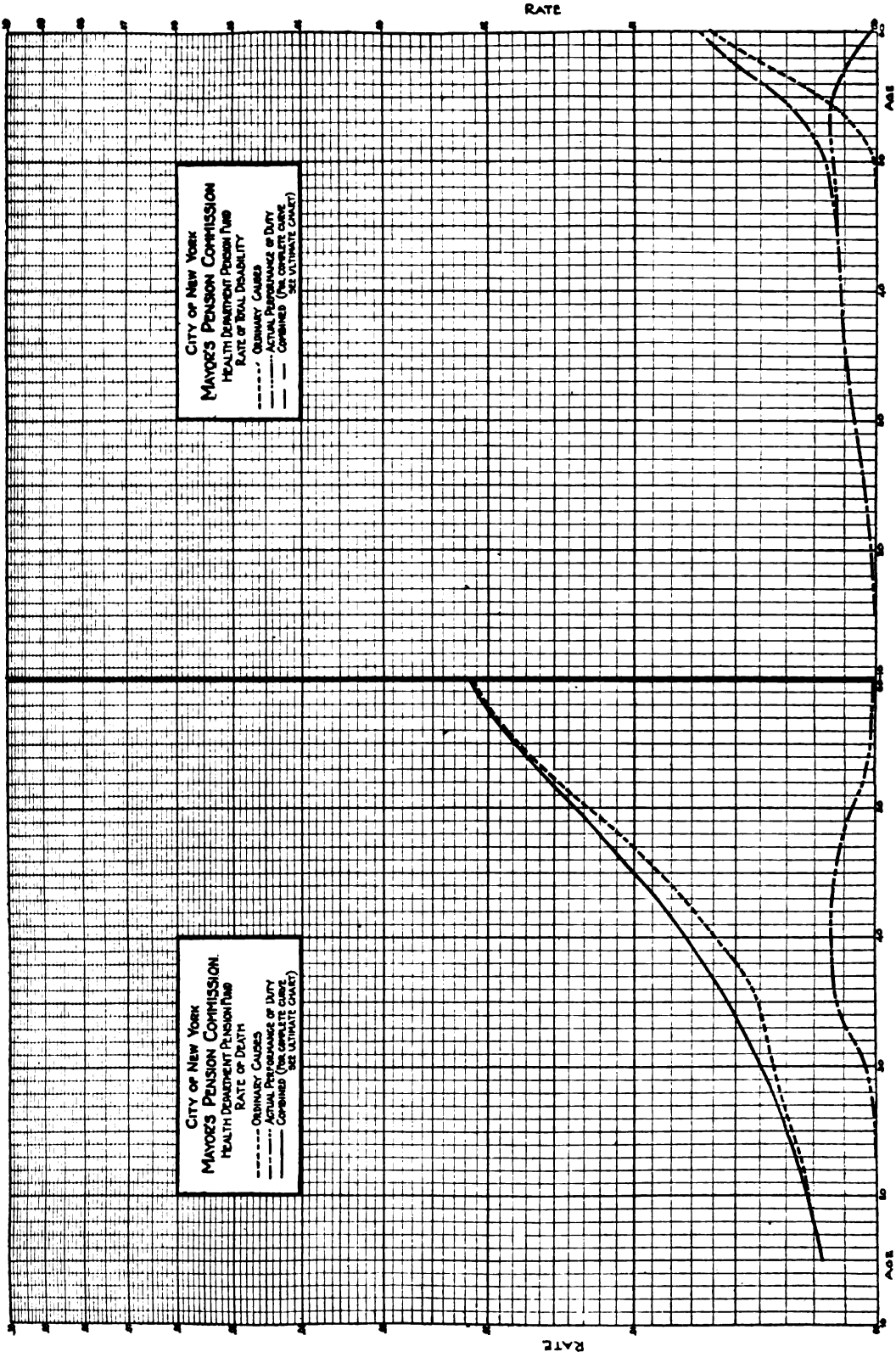
AGE	RATES OF DEATH				RATES OF DISABILITY				Rate of Service Retirement $\bullet r q_x^{(s)}$	
	NOT IN PERFORMANCE OF DUTY			Total Ultimate $d_x^{(a)}$	IN PERFORMANCE OF DUTY			Not in Performance of Duty $\bullet t r q_x^{(a)}$		Total Ultimate $\bullet t r q_x^{(a)}$
	$\bullet d_x^{(a)}$	$\bullet d_x^{(a)} q_{[x-1]+1}^{(a)}$	$\bullet d_x^{(a)} q_{[x-2]+2}^{(a)}$		$\bullet t r q_{[x-1]+1}^{(a)}$	$\bullet t r q_{[x-2]+2}^{(a)}$	$\bullet t r q_x^{(a)}$			
510147	...	...	.0016	.0003	.0019	.0311
520150	...	...	.0016	.0005	.0021	.0338
530160	...	...	.0016	.0008	.0024	.0365
540169	...	...	.0015	.0013	.0028	.0391
550179	...	...	.0015	.0019	.0034	.0419
560189	...	...	.0014	.0027	.0041	.0450
570198	...	...	.0012	.0036	.0048	.0480
580206	...	...	.0009	.0045	.0054	.0510
590211	...	...	.0005	.0056	.0061	.0541
600216	...	...	.0003	.0065	.0068	.0575
610220	...	...	.0002	.0072	.0074	.0612
620223	...	...	.0001	.0076	.0077	.0650
630227	...	...	.0001	.0079	.0080	.0690
640231	...	...	...	.0082	.0082	.0735
650233	...	...	...	.0083	.0083	.0782
660237	...	...	...	.0083	.0083	.0840
670240	...	...	...	.0082	.0082	.0900
680244	...	...	...	.0077	.0077	.0971
690249	...	...	...	.0069	.0069	.1057
700255	...	...	...	.0060	.0060	.1157
710262	...	...	...	.0050	.0050	.1285
720271	...	...	...	.0043	.0043	.1440
730284	...	...	...	.0036	.0036	.1640
740298	...	...	...	.0031	.0031	.1900
750316	...	...	...	.0026	.0026	.2260
760339	...	...	...	.0021	.0021	.2720
770366	...	...	...	.0017	.0017	.3230
780400	...	...	...	.0014	.0014	.3730
790448	...	...	...	.0010	.0010	.4210
800507	...	...	...	.0007	.0007	.4740
810600	...	...	...	.0003	.0003	.5330
820750	...	...	...	...	...	.5910
831145	...	...	...	...	...	.6460
841970	...	...	...	...	...	.7000
852650	...	...	...	...	...	.7450

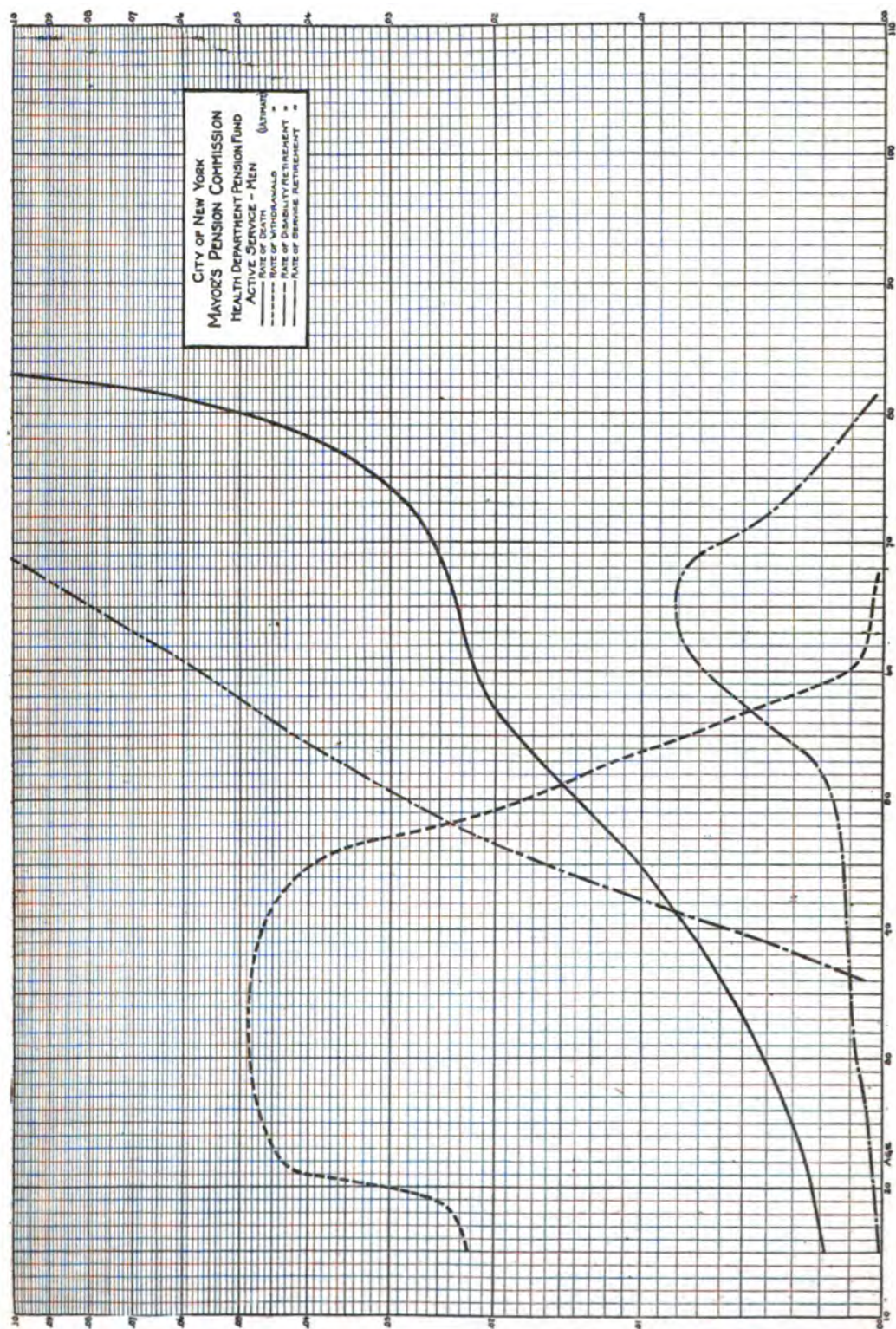












RATES OF RESIGNATION AND DISMISSAL

The rates of resignation for the employees in the Health Department in the first three years after entrance, as has been stated, vary materially with the exact length of service and the sex of the employees considered. The rate of resignation in the first year for men is the highest of any such rate developed on a select basis; being higher than that for clerks, although in the ultimate years the clerks' rate is higher.

Considered as an aggregate rate, the rate of resignation for employees in the Health Department is the highest of the seven rates of resignation prepared for city departments. The rate of resignation used for women is the same as that used for men, except in the select years for which the rate is slightly lower in the first year and higher in the second and third years.

The aggregate rate of dismissal for men ranks next to the lowest of all the dismissal rates derived, lying between that for the Police Department, which is higher, and that for the Fire Department, which is the lowest of the seven rates prepared.

The rates of resignation and dismissal combined form a total rate of withdrawal for the Health Department, which is the highest of all such rates considered, the next highest being that for clerks in the City of New York Employees' Retirement Fund. The total rate of withdrawal from service by resignation or dismissal in the Health Department changes little from age twenty-eight to about age thirty-eight.

Rates of withdrawal in other branches of the city service are higher in the age groups from twenty to thirty, but in general decrease more rapidly after their maximum points are reached. It may be that the number of professional men in the Health Department, which is about half of the total force, is large enough to influence the rate of withdrawal of all employees and that the inclination of this class of employees to resign in order to practice privately causes the rates of separation to be higher than among the general employees who have become established in their occupations.

RATE OF DEATH

Two rates of death were required for valuing pensions in the Health Department—the first covering deaths resulting from the actual performance of duty and the second covering other deaths. The rate of death from injuries sustained or disease contracted in the actual performance of duty ranks third among the rates for the four departments in which special benefits are allowed under such circumstances; lying between the rate for the Fire Department, which is higher, and for the Police Department, which is lower. The experience of the fund in this regard was incomplete and could be used only as indicative of certain tendencies of the rate and not as a mathematical forecast. The difficulties in deducing a rate and in supplementing the experience by that of other departments lay in the fact that many occupations of varying degrees of hazard are represented in the active force. As all pensions to dependents are based upon this rate, an effort was made to cover completely the future cost of such pensions by adopting a rate which will give the maximum number of deaths under this contingency that can be reasonably expected in the future. The experience seemed to indicate that the active force is exposed to deaths from causes connected

with the performance of duty at older ages than the active force of the Fire Department. The rate in the Health Department is lower than the corresponding rate of the Fire Department to approximately age 35. From this age it exceeds all other corresponding rates in the city service.

It was impossible to obtain comparative rates of much value from outside sources. For the purposes of rough comparisons, the statistics on accidental deaths during the years 1908-1909, published by the United States Bureau of Labor Statistics in Bulletin No. 157, were used. According to these figures the percentage which accidental deaths formed of deaths from all causes, was 4.7% among physicians and surgeons; 9.9% among laborers, and 5.9% among clerks. Approximately 48% of the total force in the Health Department are medical officers; 29% are grouped under the general heading of laborers, and the rest of the force is largely clerical. Approximately 10% of the total deaths of the Health Department are considered as being caused by injuries sustained or disease contracted in the actual performance of duty.

The rate of death from other causes was developed from the experience of the fund. It ranks third among the four such rates developed.

The two rates together form a total death rate for the Health Department which is the central one of the eleven death rates prepared; lying between that for the Police Department, which is higher, and that for the Fire Department, which is lower. It is the central rate, however, only until approximately age 55. From this age to about age 70 it does not increase as rapidly as do the other rates, with the exception of the rates for clerks and street cleaners, and consequently it drops from the central position to a position next to the lowest. Probably in this period employees who are physically less fit are leaving the service by retirement, as indicated by the comparatively high retirement rate, thereby reducing the mortality rate of the men who remain in active service.

RATE OF DISABILITY

Two rates of disability were required for valuing pensions for the Health Department, the first covering disability arising from causes connected with the actual performance of duty and the second covering disability from other causes. Disability arising from causes connected with the actual performance of duty is the only ground upon which employees with less than twenty years' service may be retired on pension. All cases of disability in the Health Department to date were reported as arising from such causes, therefore the experience could not be used as indicative of the other rate.

The rate of disability in the actual performance of duty exceeds all corresponding rates in the city service except that for the Police Department, and it is followed by the rate for the Fire Department. The rate of disability from causes not connected with the actual performance of duty was an adopted rate which resembles more closely in general trend a similar rate for men school teachers than it resembles any other rate for city employees. The rate as a whole is the lowest used for any of the four departments for which such a rate was required. It is somewhat higher to age 60 than corresponding rates developed from the experience of fraternal socie-

ties in Canada. In the development of this latter rate an attempt was made to exclude hazardous occupations from the experience and to eliminate all cases of temporary disability. While the rate for the Canadian societies increases beyond age 60, the rate for the Health Department decreases, as the experience indicates that at those ages retirements will probably be made under the service retirement benefit.

The two rates combined form an aggregate rate of disability which is, with the single exception of the one for men teachers, the lowest among the ten such rates prepared, the next higher being that applying to clerks in the City of New York Employees' Retirement Fund.

RATE OF SERVICE RETIREMENT

In comparison with rates of retirement for similar classes of employees in the city service, that adopted for the Health Department is high to approximately age 67, where it is exceeded by the corresponding rate among men school teachers. It does not increase rapidly from that age, and at age 78 is exceeded by the rate of retirement adopted for clerks under the City of New York Employees' Retirement Fund. The rate for the Health Department would seem to indicate that employees who do not retire in the age groups 45-60—that is, who do not retire when it is possible to adopt a new occupation or to practice privately, prefer to remain in the service beyond the time of eligibility for retirement. The rate considered as a whole up to age 65 stands fourth out of twelve rates developed, being exceeded by the corresponding rates for the firemen, policemen, and women teachers.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

The table on page 143 shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross section paper is given on page 144.

DISABILITY PENSIONERS

Because of the small experience the death rate used for disability pensioners of the Health Department is an adopted one. As a whole it ranks about midway between the several rates of mortality developed for disability pensioners. The next higher rate is for firemen, while the next lower rate is for men teachers. The rate as adopted very nearly coincides with the corresponding rate for the Police Department from ages 40 to 60. From age 60 to age 70 it is similar to the rate for men school teachers, but it increases more rapidly than the later rate, and at age 75 exceeds Hunter's rate of death among disabled lives, which was adopted for the pensioners of the Supreme Court.

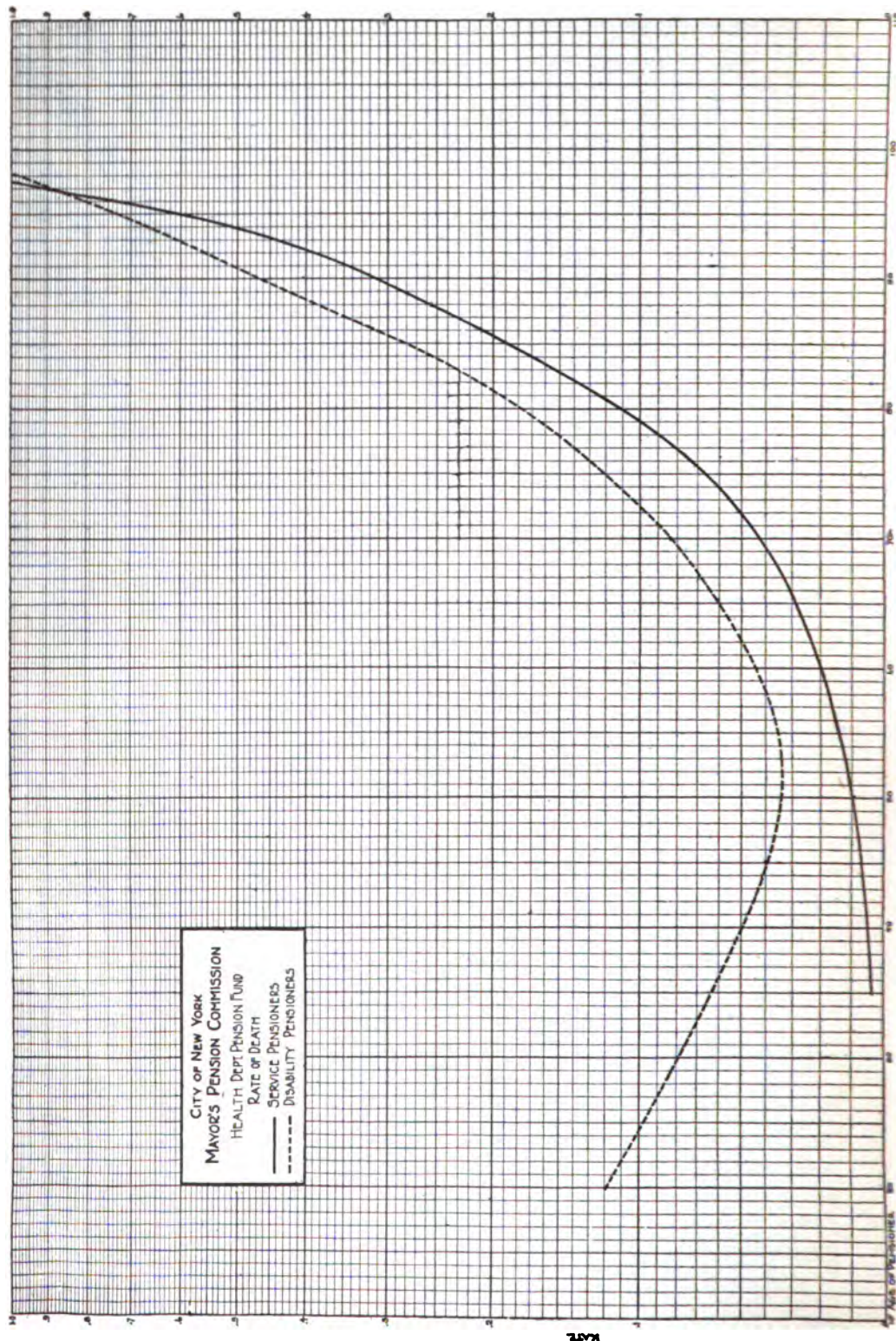
SERVICE PENSIONERS

The rate of death is lower for service pensioners of the Health Department than for the service pensioners of any other classes of the city employees, except the women school teachers. It is generally lower than McClintock's rate of death among annuitants, which was adopted as the rate of death for pensioners in the funds of the City College and of the Supreme Court.

TABLE 74—RATES OF MORTALITY AMONG PENSIONERS

Health Department Pension Fund

Age	Disability	Service	Age	Disability	Service
20	.1200	...	61	.0474	.0223
21	.1157	...	62	.0503	.0240
22	.1110	...	63	.0535	.0258
23	.1067	...	64	.0570	.0279
24	.1023	...	65	.0608	.0299
25	.0982	...	66	.0659	.0323
26	.0944	...	67	.0692	.0348
27	.0906	...	68	.0739	.0377
28	.0869	...	69	.0789	.0408
29	.0833	...	70	.0843	.0439
30	.0800	...	71	.0909	.0479
31	.0765	...	72	.0977	.0519
32	.0734	...	73	.1050	.0565
33	.0704	...	74	.1135	.0619
34	.0673	...	75	.1220	.0678
35	.0644	.0049	76	.1316	.0748
36	.0615	.0051	77	.1420	.0827
37	.0587	.0053	78	.1533	.0914
38	.0560	.0055	79	.1655	.1014
39	.0533	.0058	80	.1800	.1125
40	.0509	.0062	81	.1965	.1250
41	.0487	.0064	82	.2140	.1387
42	.0465	.0067	83	.2340	.1547
43	.0444	.0071	84	.2560	.1710
44	.0425	.0074	85	.2820	.1890
45	.0408	.0077	86	.3100	.2100
46	.0393	.0083	87	.3450	.2330
47	.0381	.0087	88	.3860	.2560
48	.0371	.0093	89	.4280	.2830
49	.0363	.0098	90	.4700	.3130
50	.0356	.0104	91	.5150	.3500
51	.0352	.0110	92	.5600	.3940
52	.0350	.0118	93	.6100	.4460
53	.0353	.0126	94	.6640	.5150
54	.0358	.0134	95	.7260	.6140
55	.0365	.0144	96	.7980	.7440
56	.0376	.0154	97	.8880	.9050
57	.0389	.0166	98	.9850	1.0000
58	.0405	.0178	99	1.0000	...
59	.0424	.0192	100	...	...
60	.0449	.0207	..	...	...



SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above:

TABLE 75—SELECT ACTIVE SERVICE TABLE AND SALARY SCALES
Health Department Pension Fund—Men

AGE	LIVING					RESIGNATIONS				WITHDRAWALS			
	$l_x^{(a)}$	$l_{x-1}^{(a)}$	$l_{x-2}^{(a)}$	$l_{x-3}^{(a)}$	$l_x^{(a)}$	$r_{x-1}^{(a)}$	$r_{x-2}^{(a)}$	$r_{x-3}^{(a)}$	$r_{x-4}^{(a)}$	$r_{x-1}^{(a)}$	$r_{x-2}^{(a)}$	$r_{x-3}^{(a)}$	$r_{x-4}^{(a)}$
15	1,000,000	...	...	...	...	23,200	...	...	...	...	...	...	...
16	988,281	957,014	...	...	...	26,881	24,882	...	...	...	...	...	...
17	977,342	942,283	913,015	...	...	29,211	29,211	22,825	...	...	...	...	...
18	964,572	927,107	894,894	872,012	...	38,101	34,303	28,637	...	...	...	...	...
19	943,691	909,440	875,773	849,226	...	46,052	40,925	35,031	...	5,755	...	...	20,754
20	926,780	882,051	852,927	825,154	...	54,241	45,807	38,484	...	8,484	...	...	21,987
21	909,709	852,609	822,254	797,204	...	62,445	50,304	41,793	...	14,020	...	...	25,820
22	896,052	823,997	789,838	762,096	...	70,649	58,304	47,691	...	22,641	...	...	32,925
23	881,002	794,119	756,874	726,618	...	78,853	66,500	55,252	...	24,387	...	...	33,265
24	866,369	764,081	723,835	691,691	...	87,057	74,703	63,453	...	26,030	...	...	32,698
25	849,717	733,395	690,977	657,731	...	95,261	82,905	71,643	...	27,723	...	...	31,693
26	836,279	704,479	658,102	624,838	...	103,465	91,106	80,844	...	29,416	...	...	30,597
27	821,160	675,050	626,294	593,084	...	111,669	99,309	89,042	...	31,110	...	...	29,430
28	804,529	645,118	595,305	562,521	...	119,873	107,513	97,246	...	32,804	...	...	28,202
29	787,069	615,616	564,069	531,118	...	128,077	115,717	105,450	...	34,498	...	...	27,001
30	767,969	586,022	535,912	502,521	...	136,281	123,921	113,654	...	36,192	...	...	25,787
31	734,821	558,253	508,121	477,957	...	144,485	132,125	121,858	...	37,886	...	...	24,488
32	698,429	530,218	481,130	452,201	...	152,689	140,329	130,600	...	39,580	...	...	23,272
33	662,296	502,953	455,159	427,635	...	160,893	148,533	139,801	...	41,274	...	...	22,067
34	627,019	476,290	430,266	402,196	...	169,097	156,737	148,003	...	42,968	...	...	20,929
35	591,030	450,200	406,501	381,951	...	177,301	164,941	156,205	...	44,662	...	...	19,733
36	555,418	424,685	383,593	360,869	...	185,505	173,145	164,409	...	46,356	...	...	18,616
37	520,052	399,588	361,306	340,505	...	193,709	181,349	172,613	...	48,050	...	...	17,550
38	484,194	375,105	339,693	320,953	...	201,913	189,553	180,817	...	49,744	...	...	16,453
39	449,813	351,309	318,910	302,119	...	210,117	197,757	189,021	...	51,438	...	...	15,370
40	415,288	328,051	298,700	284,036	...	218,321	205,961	197,233	...	53,132	...	...	14,351
41	...	305,231	279,288	266,577	...	226,525	214,165	205,699	...	54,826	...	...	13,293
42	...	...	260,347	249,815	...	234,729	222,369	213,903	...	56,520	...	...	12,241
43	...	...	...	233,691	...	...	...	...	...	58,214	...	...	11,227
44	...	...	...	218,280	...	...	...	...	...	60,908	...	...	10,212
45	...	...	...	203,677	...	...	...	...	...	63,602	...	...	9,163
46	...	...	...	189,889	...	...	...	...	...	66,296	...	...	8,127
47	...	...	...	177,059	...	...	...	...	...	68,990	...	...	6,946
48	...	...	...	165,407	...	...	...	...	...	71,684	...	...	5,605
49	...	...	...	155,041	...	...	...	...	...	74,378	...	...	4,155
50	...	...	...	145,439	...	...	...	...	...	77,072	...	...	3,288
										2,385			2,621

TABLE 75—SELECT ACTIVE SERVICE TABLE AND SALARY SCALES—Continued
Health Department Pension Fund—Men

AGE	LIVING				RESIGNATIONS				Dismissals	Total Ultimate
	$l_x^{(a)}$	$l_{x-1}^{(a)}+1$	$l_{x-2}^{(a)}+2$	$l_x^{(a)}$	$r w_x^{(a)}$	$r w_{x-1}^{(a)}+1$	$r w_{x-2}^{(a)}+2$	$r w_x^{(a)}$		
51	136,416	...	...	...	1,917	207	2,124
52	127,788	...	...	...	1,534	185	1,719
53	119,504	...	...	...	1,219	164	1,383
54	111,518	...	...	...	926	145	1,071
55	103,847	...	...	...	698	125	823
56	96,427	...	...	...	513	111	624
57	89,219	...	...	...	357	97	454
58	82,265	...	...	...	218	85	303
59	75,615	...	...	...	97	74	171
60	69,285	...	...	...	7	64	71
61	63,248	...	...	...	...	55	55
62	57,453	...	...	...	...	47	47
63	51,936	...	...	...	...	39	39
64	46,716	...	...	...	...	31	31
65	41,788	...	...	...	...	23	23
66	37,174	...	...	...	...	15	15
67	32,846	...	...	...	...	7	7
68	28,823	...	...	...	...	2	2
69	25,094	...	...	...	...	...	...
70	21,641	...	...	...	...	...	...
71	18,453	...	...	...	...	...	...
72	15,504	...	...	...	...	...	...
73	12,784	...	...	...	...	...	...
74	10,278	...	...	...	...	...	...
75	7,988	...	...	...	...	...	...
76	5,910	...	...	...	...	...	...
77	4,090	...	...	...	...	...	...
78	2,612	...	...	...	...	...	...
79	1,530	...	...	...	...	...	...
80	816	...	...	...	...	...	...
81	387	...	...	...	...	...	...
82	157	...	...	...	...	...	...
83	52	...	...	...	...	...	...
84	12	...	...	...	...	...	...
85	1	...	...	...	...	...	...

TABLE 75—SELECT ACTIVE SERVICE TABLE AND SALARY SCALES—Continued
Health Department Pension Fund—Men

Age	DEATHS		SEPARATIONS BY DISABILITY				Service Retirements	Salary Scales for Valuing	
	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total		Contributions	Pensions
	$d_d^{(a)}$ $d_d^{(a)}(s-1)+1$ $d_d^{(a)}(s-2)+2$ $d_d^{(a)}$	$d_d^{(a)}$ $d_d^{(a)}(s-1)+1$ $d_d^{(a)}(s-2)+2$ $d_d^{(a)}$	$d_d^{(a)}$ $d_d^{(a)}(s-1)+1$ $d_d^{(a)}(s-2)+2$ $d_d^{(a)}$	$e_d^{(a)}$ $e_d^{(a)}(s-1)+1$ $e_d^{(a)}(s-2)+2$ $e_d^{(a)}$	$e_d^{(a)}$	$e_d^{(a)}$ $e_d^{(a)}(s-1)+1$ $e_d^{(a)}(s-2)+2$ $e_d^{(a)}$	$e_d^{(a)}$	s_d $s_d(s-1)+1$ $s_d(s-2)+2$ s_d	$s_d^{(a)}$ $s_d^{(a)}(s-1)+1$ $s_d^{(a)}(s-2)+2$ $s_d^{(a)}$
15	2	1,766	1,768	148	...	148	...	250	...
16	7	1,791	1,798	162	...	162	...	300	...
17	15	1,792	1,807	178	...	178	...	345	...
18	23	1,817	1,840	192	...	192	...	390	...
19	31	1,846	1,877	208	...	208	...	440	...
20	40	1,866	1,906	224	...	224	...	510	...
21	51	1,894	1,945	238	...	238	...	583	505
22	62	1,897	1,959	254	...	254	...	662	578
23	73	1,889	1,962	267	...	267	...	735	648
24	85	1,900	1,985	282	...	282	...	800	708
25	99	1,901	2,000	296	...	296	...	860	759
26	114	1,898	2,012	312	...	312	...	913	804
27	132	1,902	2,034	327	...	327	...	960	839
28	153	1,906	2,050	343	...	343	...	1,000	875
29	182	1,886	2,068	361	...	361	...	1,038	910
30	223	1,857	2,080	377	...	377	...	1,070	945
31	284	1,814	2,098	386	...	386	...	1,098	980
32	389	1,718	2,107	392	...	392	...	1,122	1,020
33	470	1,647	2,117	393	...	393	...	1,143	1,064
34	496	1,626	2,122	390	...	390	...	1,163	1,117
35	503	1,632	2,135	391	...	391	...	1,180	1,187
36	499	1,633	2,132	387	...	387	...	1,200	1,272
37	486	1,652	2,138	382	...	382	...	1,212	1,370
38	470	1,674	2,144	373	...	373	...	1,223	1,468
39	450	1,683	2,133	361	...	361	...	1,234	1,550
40	427	1,703	2,130	346	...	346	...	1,243	1,615
41	402	1,736	2,138	330	...	330	...	1,250	1,672
42	375	1,748	2,123	313	...	313	...	1,258	1,712
43	348	1,762	2,110	296	...	296	...	1,260	1,742
44	320	1,780	2,100	282	2	284	...	1,262	1,773
45	291	1,799	2,090	269	3	272	...	1,262	1,790
46	262	1,808	2,070	260	3	263	...	1,262	1,806
47	232	1,822	2,054	252	5	257	...	1,258	1,815
48	202	1,836	2,038	247	6	253	...	1,250	1,817
49	168	1,863	2,031	242	10	252	...	1,240	1,809
50	124	1,895	2,019	231	22	253	...	1,228	1,796
							4,130		1,768

TABLE 75—SELECT ACTIVE SERVICE TABLE AND SALARY SCALES—Continued
Health Department Pension Fund—Men

Age	DEATHS			SEPARATIONS BY DISABILITY			Salary Scales for Valuing		
	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total	Service Retirements	Contributions	Pensions
	$d_{(a)}^{(1)}$ $d_{(a)}^{(2)}(s-1)+1$ $d_{(a)}^{(3)}(s-2)+3$ $d_{(a)}^{(4)}$	$o_{(a)}^{(1)}$ $o_{(a)}^{(2)}(s-1)+1$ $o_{(a)}^{(3)}(s-2)+3$ $o_{(a)}^{(4)}$	$d_{(a)}^{(1)}$ $d_{(a)}^{(2)}(s-1)+1$ $d_{(a)}^{(3)}(s-2)+3$ $d_{(a)}^{(4)}$	$o_{(a)}^{(1)}$ $o_{(a)}^{(2)}(s-1)+1$ $o_{(a)}^{(3)}(s-2)+3$ $o_{(a)}^{(4)}$	$o_{(a)}^{(1)}$ $o_{(a)}^{(2)}(s-1)+1$ $o_{(a)}^{(3)}(s-2)+3$ $o_{(a)}^{(4)}$	$o_{(a)}^{(1)}$ $o_{(a)}^{(2)}(s-1)+1$ $o_{(a)}^{(3)}(s-2)+3$ $o_{(a)}^{(4)}$	$o_{(a)}^{(1)}$ $o_{(a)}^{(2)}(s-1)+1$ $o_{(a)}^{(3)}(s-2)+3$ $o_{(a)}^{(4)}$	$s_{(a)}^{(1)}$ $s_{(a)}^{(2)}(s-1)+1$ $s_{(a)}^{(3)}(s-2)+3$ $s_{(a)}^{(4)}$	$s_{(a)}^{(1)}$ $s_{(a)}^{(2)}(s-1)+1$ $s_{(a)}^{(3)}(s-2)+3$ $s_{(a)}^{(4)}$
51	87	1,918	2,005	217	39	256	4,243	1,215	1,735
52	66	1,917	1,983	203	60	263	4,319	1,200	1,695
53	53	1,907	1,960	187	94	281	4,362	1,180	1,643
54	43	1,884	1,927	170	123	313	4,360	1,163	1,588
55	35	1,855	1,890	153	203	356	4,351	1,146	1,527
56	29	1,820	1,849	131	265	396	4,339	1,128	1,468
57	23	1,770	1,793	105	319	424	4,283	1,110	1,413
58	20	1,687	1,707	73	371	444	4,196	1,092	1,357
59	16	1,595	1,611	35	422	457	4,091	1,078	1,304
60	13	1,497	1,510	24	448	472	3,984	1,063	1,255
61	11	1,393	1,404	15	450	465	3,871	1,050	1,210
62	9	1,284	1,293	8	435	443	3,734	1,040	1,168
63	7	1,177	1,184	4	409	413	3,584	1,030	1,134
64	6	1,075	1,081	2	360	382	3,434	1,024	1,099
65	5	973	978	...	345	345	3,122	1,016	1,070
66	4	879	883	...	308	308	3,122	1,005	1,045
67	3	789	792	...	268	268	2,956	995	1,020
68	2	704	706	...	222	222	2,799	982	995
69	2	625	627	...	174	174	2,652	968	973
70	1	553	554	...	130	130	2,504	950	953
71	1	484	485	...	93	93	2,371	933	934
72	1	421	422	...	66	66	2,232	917	917
73	1	362	363	...	46	46	2,097	888	898
74	...	306	306	...	31	31	1,953	863	878
75	...	253	253	...	20	20	1,805	832	863
76	...	200	200	...	12	12	1,608	798	844
77	...	150	150	...	7	7	1,321	757	825
78	...	104	104	...	4	4	974	713	806
79	...	68	68	...	2	2	644	667	788
80	...	41	41	...	1	1	387	621	769
81	...	23	23	...	...	...	207	573	749
82	...	12	12	...	...	...	93	529	730
83	...	6	6	...	...	...	34	487	710
84	...	2	2	...	...	...	9	440	692
85	...	...	...	...	...	...	1	416	669

TABLE 76—SELECT ACTIVE SERVICE TABLE AND SELECT VETERAN'S TABLE

AGE	LIVING				RESIGNATIONS				WITHDRAWALS	
	$l_{[x]}^{(0)}$	$l_{[x-1]+1}^{(0)}$	$l_{[x-2]+2}^{(0)}$	$l_{[x]}^{(0)}$	Resignations				Diam Issue	Total Ultimate
					$r_{[x]}^{(0)}$	$r_{[x-1]+1}^{(0)}$	$r_{[x-2]+2}^{(0)}$	$r_{[x]}^{(0)}$		
15	1,000,000	...	...	...	34,200	...	...	...	$d_{[x]}^{(0)}$	$w_{[x]}^{(e)}$
16	980,947	945,924	...	...	34,529	27,716	...	...	$d_{[x]}^{(0)}$	...
17	965,255	927,301	...	...	38,610	29,674	8,901	...	$d_{[x]}^{(0)}$	...
18	948,447	879,013	...	...	44,577	31,342	13,192	...	$d_{[x]}^{(0)}$	...
19	935,077	886,839	849,226	872,013	51,804	35,030	19,552	5,755	14,909	20,754
20	904,937	857,685	825,154	849,226	62,441	38,596	25,087	8,484	13,503	21,987
21	862,970	828,566	805,159	825,154	76,796	42,008	30,596	14,020	11,800	25,820
22	828,739	803,716	774,091	797,204	88,539	46,615	36,382	22,387	10,284	32,925
23	831,698	783,109	740,010	762,096	102,277	53,251	44,388	24,996	8,878	33,265
24	880,702	769,490	719,927	740,618	116,420	66,561	53,275	25,030	7,702	32,698
25	879,469	755,352	694,008	691,691	131,041	80,067	61,073	24,796	6,654	31,693
26	871,546	740,331	667,188	657,731	146,420	93,282	66,719	24,369	5,801	30,597
27	858,398	717,741	639,664	624,838	160,778	99,048	70,393	23,783	5,001	29,430
28	842,257	690,840	611,913	593,084	173,505	100,863	72,512	23,120	4,419	28,202
29	823,028	662,469	583,694	562,521	184,358	100,695	72,902	22,386	3,881	27,001
30	797,223	632,840	555,944	533,118	188,145	98,723	72,551	21,500	3,401	25,787
31	767,866	603,642	528,681	504,902	188,895	96,281	71,372	20,648	2,979	25,787
32	734,693	573,863	502,253	477,957	185,877	92,679	69,813	19,761	2,614	23,272
33	699,691	544,011	476,379	452,201	180,520	88,511	67,646	18,902	2,306	22,067
34	662,714	514,634	450,963	427,635	172,968	83,782	64,713	17,946	2,027	20,929
35	625,235	485,447	426,553	404,196	164,437	78,642	61,637	17,035	1,787	19,733
36	585,466	456,601	402,608	381,951	153,392	73,527	58,270	16,146	1,581	18,616
37	544,422	428,151	379,441	360,809	141,005	68,076	54,535	15,220	1,404	17,550
38	503,475	399,664	350,322	340,505	128,366	62,148	50,598	14,282	1,233	16,453
39	461,283	371,484	333,911	320,953	113,937	56,354	46,414	13,384	1,088	15,370
40	419,416	343,885	311,669	302,110	99,851	50,379	41,764	12,441	967	14,351
41	...	316,267	290,178	284,036	...	44,277	37,143	11,489	852	13,293
42	...	...	268,770	266,577	...	...	31,984	10,568	752	12,241
43	...	...	...	249,815	...	...	...	9,628	659	11,227
44	...	...	...	233,691	...	...	...	8,655	584	10,212
45	...	...	...	218,280	...	...	...	7,670	508	9,163
46	...	...	...	203,677	...	...	...	6,551	448	8,127
47	...	...	...	189,889	...	...	...	5,258	395	7,096
48	...	...	...	177,059	...	...	...	3,854	347	6,046
49	...	...	...	165,407	...	...	...	3,022	301	5,005
50	...	...	...	155,041	...	...	...	2,385	266	4,155
51	...	...	...	145,439	...	...	...	1,917	236	3,288
52	...	...	...	136,416	...	...	...	1,534	207	2,621
53	...	...	...	127,788	...	...	...	1,219	185	2,124
	...	...	...	119,504	...	...	...	1,064	164	1,719
	...	...	...	...	...	...	...	...	...	1,383

Health Department Pension Fund—Women

AGE	DEATHS			SEPARATIONS BY DISABILITY			Service Retirements	SALARY SCALES FOR VALUING	
	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total		Contribution	Pensions
$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$a_{d[2]}^{(a)}$	$s_{[2]}^{(a)}$	$s_{[2]}^{(a)}$
$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$a_{d[2-1]+1}^{(a)}$	$s_{[2-1]+1}^{(a)}$	$s_{[2-1]+1}^{(a)}$
$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$a_{d[2-2]+2}^{(a)}$	$s_{[2-2]+2}^{(a)}$	$s_{[2-2]+2}^{(a)}$
$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	$a_{d_2^{(a)}}$	s_2	s_2
15	2	1,766	1,768	148	...	148	...	250	...
16	7	1,791	1,798	162	...	162	...	300	...
17	15	1,792	1,807	178	...	178	...	345	...
18	23	1,817	1,840	192	...	192	...	390	...
19	31	1,846	1,877	208	...	208	...	440	...
20	40	1,866	1,906	224	...	224	...	505	...
21	51	1,894	1,945	238	...	238	...	578	...
22	62	1,897	1,959	254	...	254	...	662	...
23	73	1,889	1,962	267	...	267	...	735	...
24	85	1,900	1,985	282	...	282	...	800	...
25	99	1,901	2,000	296	...	296	...	860	...
26	114	1,898	2,012	312	...	312	...	913	...
27	132	1,902	2,034	327	...	327	...	960	...
28	153	1,906	2,059	343	...	343	...	1,000	...
29	182	1,886	2,068	361	...	361	...	1,038	...
30	223	1,857	2,080	377	...	377	...	1,070	...
31	284	1,814	2,098	386	...	386	...	1,098	...
32	359	1,718	2,107	392	...	392	...	1,122	...
33	470	1,647	2,117	393	...	393	...	1,143	...
34	496	1,626	2,122	390	...	390	...	1,163	...
35	593	1,632	2,135	391	...	391	...	1,180	...
36	499	1,633	2,132	387	...	387	...	1,200	...
37	486	1,652	2,138	382	...	382	...	1,212	...
38	470	1,674	2,144	373	...	373	...	1,223	...
39	450	1,683	2,133	361	...	361	...	1,234	...
40	427	1,703	2,130	346	...	346	...	1,243	...
41	402	1,736	2,138	330	...	330	...	1,250	...
42	375	1,748	2,123	313	...	313	...	1,258	...
43	348	1,762	2,110	296	...	296	...	1,262	...
44	320	1,780	2,100	284	2	284	...	1,262	...
45	291	1,799	2,090	269	3	272	...	1,262	...
46	262	1,808	2,070	260	3	263	...	1,262	...
47	232	1,822	2,054	252	5	257	...	1,262	...
48	202	1,836	2,038	247	6	253	...	1,262	...
49	168	1,863	2,031	242	10	253	...	1,262	...
50	124	1,895	2,019	231	22	253	...	1,262	...
51	87	1,918	2,005	217	39	256	...	1,262	...
52	66	1,917	1,983	203	60	263	...	1,262	...
53	53	1,907	1,960	187	94	281	...	1,262	...

TABLE 77—DISABILITY PENSIONERS' MORTALITY TABLE

Health Department Pension Fund

Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$	Age	Living $l_z^{(0)}$	Dying $d_z^{(0)}$
20	1,000,000	120,000	59	80,458	3,411
21	880,000	101,816	60	77,047	3,460
22	778,184	86,378	61	73,587	3,488
23	691,806	73,816	62	70,099	3,526
24	617,990	63,220	63	66,573	3,561
25	554,770	54,479	64	63,012	3,592
26	500,291	47,227	65	59,420	3,613
27	453,064	41,048	66	55,807	3,678
28	412,016	35,804	67	52,129	3,607
29	376,212	31,339	68	48,522	3,586
30	344,873	27,589	69	44,936	3,545
31	317,284	24,273	70	41,391	3,489
32	293,011	21,507	71	37,902	3,446
33	271,504	19,114	72	34,456	3,366
34	252,390	16,985	73	31,090	3,264
35	235,405	15,160	74	27,826	3,159
36	220,245	13,545	75	24,667	3,009
37	206,700	12,134	76	21,658	2,850
38	194,566	10,895	77	18,808	2,671
39	183,671	9,790	78	16,137	2,474
40	173,881	8,851	79	13,663	2,261
41	165,030	8,037	80	11,402	2,052
42	156,993	7,300	81	9,350	1,838
43	149,693	6,646	82	7,512	1,607
44	143,047	6,080	83	5,905	1,382
45	136,967	5,588	84	4,523	1,158
46	131,379	5,163	85	3,365	949
47	126,216	4,809	86	2,416	749
48	121,407	4,504	87	1,667	575
49	116,903	4,244	88	1,092	421
50	112,659	4,010	89	671	287
51	108,649	3,825	90	384	180
52	104,824	3,669	91	204	105
53	101,155	3,570	92	99	56
54	97,585	3,494	93	43	26
55	94,091	3,434	94	17	12
56	90,657	3,409	95	5	4
57	87,248	3,394	96	1	1
58	83,854	3,396	..	...	...

TABLE 78—SERVICE PENSIONERS' MORTALITY TABLE**Health Department Pension Fund**

Age	Living $l_x^{(p)}$	Dying $d_x^{(p)}$	Age	Living $l_x^{(p)}$	Dying $d_x^{(p)}$
35	235,405	1,153	67	152,576	5,310
36	234,252	1,195	68	147,266	5,552
37	233,057	1,235	69	141,714	5,782
38	231,822	1,275	70	135,932	5,967
39	230,547	1,338	71	129,965	6,225
40	229,209	1,421	72	123,740	6,422
41	227,788	1,458	73	117,318	6,628
42	226,330	1,516	74	110,690	6,852
43	224,814	1,596	75	103,838	7,040
44	223,218	1,652	76	96,798	7,240
45	221,566	1,706	77	89,558	7,407
46	219,860	1,825	78	82,151	7,509
47	218,035	1,897	79	74,642	7,569
48	216,138	2,010	80	67,073	7,546
49	214,128	2,098	81	59,527	7,441
50	212,030	2,205	82	52,086	7,224
51	209,825	2,308	83	44,862	6,940
52	207,517	2,449	84	37,922	6,485
53	205,068	2,584	85	31,437	5,942
54	202,484	2,713	86	25,495	5,354
55	199,771	2,877	87	20,141	4,693
56	196,894	3,032	88	15,448	3,955
57	193,862	3,218	89	11,493	3,253
58	190,644	3,394	90	8,240	2,579
59	187,250	3,595	91	5,661	1,982
60	183,655	3,802	92	3,679	1,450
61	179,853	4,011	93	2,229	995
62	175,842	4,220	94	1,234	636
63	171,622	4,428	95	598	368
64	167,194	4,665	96	230	172
65	162,529	4,860	97	58	54
66	157,669	5,093	98	4	4

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following tables are based on an entrance salary of \$1,000 and show the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 120. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 79—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS, PAYABLE TO THESE MEMBERS AND THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1,000 FOR VALUES DETERMINED BY SALARY, AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Health Department Pension Fund—Men

Age at ENTRANCE	Total Future Salary	Total of All Pension Benefits	PENSIONS TO MEMBERS						Pensions to Widows of Members Dying in Performance of Duty	Pensions to Children of Members Dying in Performance of Duty	Pensions to Dependent Parents of Members Dying in Performance of Duty
			Total	Upon Service Retirement	UPON DISABILITY			From Ordinary Causes After 20 Years Service			
					Total	In Performance of Duty					
20	\$17,853	\$770	\$751	\$664	\$87	\$75	\$12	\$16	\$1	\$2	
25	9,792	531	506	446	60	51	9	20	2	3	
30	7,448	507	476	416	60	50	10	26	2	3	
35	6,595	542	509	441	68	55	13	29	2	2	
40	6,205	598	507	498	69	58	11	26	2	3	

*Total Future Salary Estimated without use of $e^{1/2}$ column, which was used to obtain cost of Service Pension only.

TABLE 80—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS PAYABLE TO THESE MEMBERS AND THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1000, FOR VALUES DETERMINED BY SALARY AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Health Department Pension Fund—Women

AGE AT ENTRANCE	*Total Future Salary	Total of all Pension Benefits	PENSIONS TO MEMBERS					Pensions to Dependent Parents of Members Dying in Performance of Duty
			Total	Upon Service Retirement	UPON DISABILITY			
					Total	In Performance of Duty	From Ordinary Causes After 20 Years Service	
20	\$18,221	\$772	\$770	\$680	\$90	\$77	\$13	\$2
25	10,063	520	517	456	61	52	9	3
30	7,275	462	459	401	58	48	10	3
35	6,339	482	480	416	64	52	12	2
40	6,253	564	561	493	68	57	11	3

*Total Future Salary Estimated without use of ⁶⁷/₁₂ Column, which was used to Obtain Cost of Service Pension only.

The following table shows the expectations of life of pensioners of various ages, together with the annuity values based on the mortality tables, which were used in valuing pensions:

TABLE 81—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY
AND SERVICE PENSIONERS
Health Department Pension Fund

AGE	ANNUITY VALUE		EXPECTATION OF LIFE		AGE	ANNUITY VALUE		EXPECTATION OF LIFE	
	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners		Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners
20	7.39	...	11.59	...	59	8.91	11.64	12.03	17.01
21	7.65	...	12.11	...	60	8.63	11.32	11.54	16.34
22	7.90	...	12.63	...	61	8.36	10.99	11.06	15.67
23	8.16	...	13.14	...	62	8.08	10.65	10.58	15.02
24	8.42	...	13.65	...	63	7.80	10.32	10.11	14.37
25	8.68	...	14.15	...	64	7.52	9.98	9.66	13.74
26	8.93	...	14.63	...	65	7.24	9.65	9.21	13.12
27	9.18	...	15.11	...	66	6.96	9.31	8.78	12.51
28	9.43	...	15.56	...	67	6.69	8.96	8.36	11.91
29	9.67	...	16.00	...	68	6.42	8.62	7.94	11.32
30	9.90	...	16.40	...	69	6.15	8.28	7.54	10.75
31	10.13	...	16.79	...	70	5.88	7.93	7.14	10.18
32	10.34	...	17.14	...	71	5.61	7.58	6.75	9.63
33	10.55	...	17.45	...	72	5.34	7.24	6.38	9.09
34	10.74	...	17.74	...	73	5.08	6.89	6.01	8.56
35	10.92	18.11	17.98	35.54	74	4.83	6.54	5.66	8.04
36	11.08	17.90	18.18	34.71	75	4.58	6.20	5.32	7.54
37	11.22	17.69	18.34	33.89	76	4.33	5.86	4.99	7.05
38	11.35	17.47	18.46	33.06	77	4.08	5.52	4.67	6.58
39	11.45	17.25	18.52	32.24	78	3.84	5.19	4.36	6.12
40	11.53	17.02	18.54	31.43	79	3.61	4.87	4.06	5.69
41	11.59	16.79	18.50	30.62	80	3.37	4.56	3.77	5.28
42	11.62	16.55	18.43	29.82	81	3.14	4.26	3.48	4.88
43	11.63	16.31	18.30	29.01	82	2.92	3.97	3.21	4.51
44	11.61	16.06	18.13	28.22	83	2.70	3.69	2.95	4.15
45	11.57	15.80	17.91	27.42	84	2.49	3.42	2.70	3.82
46	11.50	15.53	17.65	26.63	85	2.29	3.17	2.46	3.51
47	11.41	15.27	17.35	25.85	86	2.09	2.92	2.23	3.21
48	11.29	14.99	17.02	25.07	87	1.89	2.69	2.01	2.93
49	11.16	14.71	16.65	24.30	88	1.71	2.46	1.80	2.66
50	11.00	14.43	16.26	23.54	89	1.54	2.24	1.62	2.41
51	10.83	14.14	15.85	22.78	90	1.40	2.03	1.46	2.16
52	10.63	13.84	15.41	22.03	91	1.26	1.82	1.31	1.92
53	10.42	13.54	14.95	21.29	92	1.13	1.60	1.17	1.68
54	10.19	13.23	14.47	20.55	93	1.01	1.40	1.03	1.45
55	9.95	12.92	13.99	19.83	94	.83	.97	.85	1.22
56	9.70	12.61	13.50	19.11	95	.67	.76	.70	.99
57	9.45	12.29	13.01	18.40	96	...	...	...	.77
58	9.18	11.97	12.52	17.70	97	...	.57	...	.57

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 82—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Health Department Pension Fund

AGE	MEN		WOMEN		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
16	3	\$900	..	...	1,262	\$1,284,230
17	2	780	1	\$240	1,259	1,283,330
18	2	780	..	...	1,256	1,282,310
19	8	3,840	1	360	1,254	1,281,530
20	15	8,400	2	580	1,245	1,277,330
21	15	7,680	2	720	1,228	1,268,350
22	16	9,600	1	600	1,211	1,259,950
23	9	6,720	1	750	1,194	1,249,750
24	9	6,900	4	3,300	1,184	1,242,280
25	10	7,770	6	4,500	1,171	1,232,080
26	10	9,980	9	5,700	1,155	1,219,810
27	14	12,960	4	2,070	1,136	1,204,130
28	18	19,110	7	5,340	1,118	1,189,100
29	18	18,550	19	15,100	1,093	1,164,650
30	13	14,670	14	9,780	1,056	1,131,000
31	27	27,540	14	12,150	1,029	1,106,550
32	30	34,370	10	7,350	988	1,066,860
33	21	24,800	18	15,850	948	1,025,140
34	33	38,600	22	19,740	909	984,490
35	31	36,500	18	14,850	854	926,150
36	28	33,320	19	16,410	805	874,800
37	35	40,920	17	13,350	758	825,070
38	26	34,980	20	17,970	706	770,800
39	35	44,620	12	9,570	660	717,850
40	38	51,020	19	18,600	613	663,660
41	39	44,690	17	18,180	556	594,040
42	35	40,580	12	10,800	500	531,170
43	23	23,790	15	9,810	453	479,790
44	25	29,990	13	10,050	415	446,190
45	28	34,720	11	9,590	377	406,150
46	18	23,220	10	7,800	338	361,840
47	25	31,810	6	5,160	310	330,820
48	16	22,620	12	7,230	279	293,850
49	18	28,350	9	4,510	251	264,000
50	15	17,670	11	7,440	224	231,140
51	13	17,180	6	5,340	198	206,030
52	11	13,220	7	5,280	179	183,510
53	10	9,420	8	6,460	161	165,010
54	20	22,860	3	2,640	143	149,130
55	13	16,990	5	3,810	120	123,630
56	15	15,690	1	360	102	102,830
57	12	12,760	3	1,950	86	86,780
58	5	5,750	1	900	71	72,070
59	6	6,120	1	360	65	65,420
60	5	6,380	1	360	58	58,940
61	9	8,320	1	1,800	52	52,200
62	7	8,250	..	...	42	42,080
63	3	1,800	1	600	35	33,830

TABLE 82—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE—Continued

Health Department Pension Fund

AGE	MEN		WOMEN		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
64	2	\$1,320	..	...	31	\$31,430
65	..	...	1	750	29	30,110
66	7	7,890	..	...	28	29,360
67	3	2,850	..	...	21	21,470
68	4	4,670	..	...	18	18,620
69	1	1,200	..	...	14	13,950
70	2	2,400	..	...	13	12,750
71	3	3,000	..	...	11	10,350
72	2	1,800	..	...	8	7,350
73	3	3,720	..	...	6	5,550
74	..	...	..	...	3	1,830
75	..	...	..	...	3	1,830
76	1	750	..	...	3	1,830
77	..	...	..	...	2	1,080
78	..	...	..	...	2	1,080
79	..	...	..	...	2	1,080
80	1	600	..	...	2	1,080
81	..	...	..	...	1	480
82	..	...	..	...	1	480
83	..	...	..	...	1	480
84	1	480	..	...	1	480

TABLE 83—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Health Department Pension Fund

TOTAL SERVICE — YEARS	MEN		WOMEN		Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
	Number	Salaries	Number	Salaries		
0	10	\$10,700	5	\$2,560	1,262	\$1,284,230
1	49	47,070	19	14,580	1,247	1,270,970
2	57	51,510	31	20,400	1,179	1,209,320
3	39	39,900	16	12,010	1,091	1,137,410
4	57	48,970	65	52,500	1,036	1,085,500
5	30	32,800	19	13,740	914	984,030
6	71	75,720	31	26,350	865	937,490
7	64	65,490	37	34,230	763	835,420
8	83	80,850	43	33,540	662	735,700
9	41	42,880	31	22,710	536	621,310
10	59	59,040	25	16,120	464	555,720
11	46	54,330	21	17,190	380	480,560
12	35	37,550	17	17,010	313	409,040
13	18	21,380	3	3,940	261	354,480
14	17	18,600	5	3,930	240	329,160
15	27	35,300	2	1,650	218	306,630
16	51	72,840	9	7,440	189	269,680
17	16	22,370	5	4,520	129	180,400
18	25	38,960	2	2,400	108	162,510
19	26	39,220	5	6,420	81	121,150
20	15	20,100	1	300	50	75,510
21	10	16,820	..	...	34	55,110
22	6	8,520	..	...	24	38,290
23	..	...	1	1,500	18	29,770
24	1	2,550	..	...	17	28,270
25	1	1,500	1	300	16	25,720
26	1	1,050	..	...	14	23,920
27	4	7,100	..	...	13	22,870
28	2	4,350	..	...	9	15,770
29	2	6,050	..	...	7	11,420
30 & over	4	4,650	1	720	5	5,370

TABLE 84—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE.

Health Department Pension Fund

Age	Number	Pensions	Age	Number	Pensions
35	1	\$450	60	2	\$1,200
40	1	360	73	1	450
41	1	680	Total Men Total Women	7	\$4,730
45	1	900		1	360
47	1	1,050	Grand Total	8	\$5,090

TABLE 85—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE**Health Department Pension Fund**

Age	Number	Pensions	Age	Number	Pensions
39	1	\$1,280	64	4	\$3,150
40	1	750	65	1	900
41	1	450	66	2	1,950
42	..	....	67	2	1,350
43	..	....	68	1	1,050
44	1	750	69	1	600
45	2	1,200	70	2	1,050
46	..	....	71	1	900
47	5	8,530	72	5	5,580
48	2	2,500	73	1	1,200
49	2	1,500	74	..	....
50	1	1,280	75	..	....
51	3	2,700	76	..	....
52	2	960	77	..	....
53	4	3,600	78	..	....
54	4	3,220	79	..	....
55	2	3,700	80	1	600
56	2	2,250	81	..	....
57	7	6,000	82	..	....
58	3	3,150	83	1	390
59	1	830	Total Men	71	\$68,180
60	4	2,780	Total Women	2	1,350
61	1	900	Grand Total	73	\$69,530
62	2	2,480			
63	..	....	

TABLE 86—NUMBER AND PENSIONS OF ALL PENSIONED DEPENDENTS CLASSIFIED BY AGE**Health Department Pension Fund**

Age	Number	Pensions	Age	Number	Pensions
10	1	\$300	64	1	\$300
37	1	300	65	1	300
41	2	600	67	1	300
42	1	300	Total Children	1	\$300
44	1	300	Total Widows	10	3,000
49	1	300	Total Parents	1	300
55	1	300	Grand Total	12	\$3,600
56	1	300			

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets and shows the complete financial condition of the fund as of that date:

**TABLE 87—A VALUATION OF ASSETS AND LIABILITIES OF
OF JUNE**

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 93 Pensioners now on the pension roll of the fund as follows:	
Service Pensioners:	
71 Men on annual pensions aggregating \$68,180	\$824,604
2 Women on annual pensions aggregating 1,350	17,278
Disability Pensioners:	
7 Men on annual pensions aggregating 4,730	47,826
1 Woman on annual pension aggregating 360	4,150
Widow Pensioners:	
10 Widows on annual pensions aggregating 3,000	38,303
Children Pensioners:	
1 Child on annual pension aggregating 300	2,036
Dependent Parent Pensioners:	
1 Parent on annual pension aggregating 300	2,681
Total Pensions Entered Upon	\$936,878
Pensions to such Employees as will retire from the present active force of 1,262 members:	
Service Pensions:	
Men	\$1,417,850
Women	370,997
Disability Pensions:	
Men:	
In Actual Performance of Duty	65,307
Any Cause after 20 years' service	38,042
Women:	
In Actual Performance of Duty	23,318
Any Cause after 20 years' service	9,366
Total Prospective Pensions to Employees	\$1,924,880
Pensions to Dependents of such employees of the present active force as will die in service:	
Widows' Pensions:	
Widows of employees who will die in Performance of Duty	\$23,946
Children's Pensions:	
Children of employees who will die in Performance of Duty	1,566
Dependent Parents' Pensions:	
Parents of employees who will die in Performance of Duty	4,410
Total Prospective Pensions to Dependents of Employees in Service	\$29,922
Total Pensions not Entered Upon	\$1,954,802
Grand Total	\$2,891,680

and liabilities of the Health Department Pension Fund as of June 30, 1914,

**THE HEALTH DEPARTMENT PENSION FUND—VALUED AS
30, 1914**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand creditable to:	
Men.....	\$248,819
Women.....	81,228
Contribution of One Percentum of Future Salaries by Employees:	
Men.....	86,222
Women.....	28,942
*Deficiency creditable to:	
Men.....	1,834,852
Women.....	611,617
Grand Total.....	\$2,891,680

*NOTE—There is no definite bases for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$460,700.

The following table shows the estimated amount of appropriation required to continue the pensions of present pensioners until death or revocation of pensions. This table does not take into account the interest factor, as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll—that is, present pensioners.

TABLE 88—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL
Health Department Pension Fund

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total	Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
0	1914	\$4,950	\$68,694	\$2,966	\$299	\$293	\$77,202	31	1945	\$569	\$10,071	\$677	...	\$2	\$11,319
1	1915	4,999	67,119	2,891	298	280	75,287	32	1946	503	8,779	621	...	1	9,904
2	1916	4,462	65,485	2,816	297	267	73,327	33	1947	440	7,587	567	...	...	8,594
3	1917	4,237	63,790	2,741	297	254	71,319	34	1948	382	6,497	516	...	...	7,395
4	1918	4,024	62,036	2,666	296	240	69,262	35	1949	329	5,511	468	...	...	6,308
5	1919	3,821	60,226	2,590	295	227	67,159	36	1950	280	4,625	422	...	...	5,327
6	1920	3,627	58,358	2,514	295	213	65,007	37	1951	235	3,841	379	...	...	4,455
7	1921	3,441	56,437	2,437	293	199	62,807	38	1952	196	3,154	338	...	...	3,688
8	1922	3,263	54,467	2,360	...	185	60,275	39	1953	160	2,558	299	...	...	3,017
9	1923	3,093	52,452	2,282	...	172	57,999	40	1954	130	2,048	263	...	...	2,441
10	1924	2,930	50,397	2,204	...	159	55,690	41	1955	103	1,618	230	...	...	1,951
11	1925	2,774	48,308	2,126	...	146	53,354	42	1956	71	1,261	199	...	...	1,531
12	1926	2,623	46,192	2,047	...	133	50,995	43	1957	63	967	172	...	...	1,202
13	1927	2,477	44,059	1,968	...	121	48,625	44	1958	48	730	148	...	...	926
14	1928	2,337	41,917	1,890	...	109	46,253	45	1959	36	541	125	...	...	702
15	1929	2,201	39,771	1,811	...	97	43,880	46	1960	27	393	105	...	...	525
16	1930	2,069	37,635	1,733	...	87	41,524	47	1961	19	281	87	...	...	387
17	1931	1,951	35,511	1,655	...	76	39,193	48	1962	14	197	72	...	...	283
18	1932	1,819	33,408	1,577	...	67	36,871	49	1963	10	135	58	...	...	203
19	1933	1,699	31,331	1,500	...	58	34,588	50	1964	7	92	46	...	...	145
20	1934	1,583	29,282	1,424	...	50	32,339	51	1965	4	59	36	...	...	99
21	1935	1,470	27,268	1,349	...	42	30,129	52	1966	3	38	27	...	...	68
22	1936	1,362	25,292	1,275	...	36	27,965	53	1967	2	23	20	...	...	45
23	1937	1,257	23,358	1,202	...	30	25,847	54	1968	1	13	14	...	...	28
24	1938	1,157	21,472	1,130	...	24	23,783	55	1969	...	6	8	...	...	15
25	1939	1,055	19,639	1,060	...	20	21,774	56	1970	...	2	5	...	...	7
26	1940	974	17,862	992	...	15	19,843	57	1971	...	1	3	...	...	4
27	1941	879	16,148	925	...	12	17,964	58	1972	...	...	2	...	...	2
28	1942	795	14,507	859	...	9	16,170	59	1973	...	...	1	...	...	1
29	1943	715	12,942	796	...	6	14,459								
30	1944	640	11,460	735	...	4	12,839								
								Total..		\$78,017	\$1,297,851	\$62,429	\$2,370	\$3,634	\$1,444,301

*Date—Year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Health Department, expressed as a percentage of the employee's salary.

TABLE 89—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE HEALTH DEPARTMENT PENSION FUND—Men

AGE AT ENTRANCE	Total	PENSION TO EMPLOYEES						Pension to Widows (4)	Pension to Children (5)	Pension to Dependent Parents (6)
		Total (1)+(2)+(3)	Service Pension (1)	DISABILITY PENSION			Not in Performance of Duty (3)			
				Total (2)+(3)	In Performance of Duty (2)					
20	4.39	4.22	3.73	.49	.42	.07	.14	.01	.02	
21	4.59	4.39	3.88	.51	.44	.07	.17	.01	.02	
22	4.82	4.58	4.04	.54	.46	.08	.20	.01	.03	
23	5.07	4.78	4.22	.56	.48	.08	.24	.02	.03	
24	5.33	5.00	4.41	.59	.50	.09	.27	.02	.04	
25	5.60	5.23	4.60	.63	.53	.10	.31	.02	.04	
26	5.89	5.46	4.80	.66	.56	.10	.35	.03	.05	
27	6.18	5.71	5.01	.70	.59	.11	.39	.03	.05	
28	6.48	5.95	5.21	.74	.62	.12	.44	.04	.05	
29	6.78	6.20	5.42	.78	.65	.13	.49	.04	.05	
30	7.07	6.44	5.61	.83	.69	.14	.53	.04	.06	
31	7.36	6.68	5.81	.87	.72	.15	.58	.04	.06	
32	7.64	6.92	6.00	.92	.75	.17	.62	.04	.06	
33	7.89	7.13	6.16	.97	.79	.18	.65	.05	.06	
34	8.12	7.34	6.33	1.01	.82	.19	.67	.05	.06	
35	8.33	7.54	6.49	1.05	.85	.20	.68	.05	.06	
36	8.53	7.73	6.64	1.09	.88	.21	.69	.05	.06	
37	8.69	7.90	6.79	1.11	.90	.21	.68	.05	.06	
38	8.82	8.03	6.91	1.12	.92	.20	.68	.04	.07	
39	8.95	8.18	7.04	1.14	.94	.20	.66	.04	.07	
40	9.03	8.27	7.14	1.13	.94	.19	.65	.04	.07	

TABLE 90—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE HEALTH DEPARTMENT PENSION FUND—Women

AGE AT ENTRANCE	Total	PENSION TO EMPLOYEES					Pension to Dependent Parents
		Total	Service Pension	DISABILITY PENSION			
				Total	In Per- formance of Duty	Not in Performance of Duty	
		(1)+(2)+(3)	(1)	(2)+(3)	(2)	(3)	(6)
20	4.25	4.23	3.74	.49	.42	.07	.02
21	4.43	4.40	3.89	.51	.44	.07	.03
22	4.62	4.59	4.05	.54	.46	.08	.03
23	4.82	4.78	4.22	.56	.48	.08	.04
24	5.02	4.98	4.39	.59	.50	.09	.04
25	5.24	5.20	4.58	.62	.53	.09	.04
26	5.47	5.43	4.77	.66	.55	.11	.04
27	5.71	5.66	4.97	.69	.58	.11	.05
28	5.95	5.90	5.17	.73	.61	.12	.05
29	6.18	6.13	5.36	.77	.64	.13	.05
30	6.42	6.37	5.55	.82	.68	.14	.05
31	6.66	6.60	5.74	.86	.71	.15	.06
32	6.89	6.83	5.92	.91	.74	.17	.06
33	7.10	7.04	6.09	.95	.77	.18	.06
34	7.31	7.25	6.25	1.00	.81	.19	.06
35	7.51	7.45	6.41	1.04	.84	.20	.06
36	7.70	7.64	6.56	1.08	.87	.21	.06
37	7.87	7.81	6.71	1.10	.89	.21	.06
38	8.02	7.95	6.83	1.12	.91	.21	.07
39	8.16	8.09	6.97	1.12	.92	.20	.07
40	8.29	8.22	7.10	1.12	.93	.19	.07

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the College of the City of New York Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

Upon application after 20 years' service as supervising officer or teacher in the college, a pension of not less than one-half final salary, with a limitation of a maximum amount of \$3,000 for professors.* If member has not had 20 years' service in the college it is sufficient if he have 10 years' service in the college and 20 years' outside service in educational institutions in the United States.

The average allowance has been about 60 per cent of final salary.

Contributions

By EMPLOYEE

No contribution.

By CITY

Indirect contributions:

Miscellaneous revenues, such as 1% of excise moneys as needed to cover maturing pensions.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners.

BASIC DATA AND THEIR DEVELOPMENT

The schedules for employees were divided into two classes; one including the supervising and teaching staff of the college who are covered by the College of the City of New York Retirement Fund, and the other

* The president of the college is entitled to an additional \$1000 annuity and the vice-president to an additional \$500 annuity on their respective retirements.

including the clerks, mechanics and laborers who are covered by the City of New York Employees' Retirement Fund. The schedules in the first class were used in connection with the valuation of the college fund, while the schedules in the second class were used in connection with the general valuation of the latter fund.

The general methods previously outlined were employed in developing the data to show unadjusted rates and in graduating the unadjusted rates. The extent of the experience is shown in the following tables:

TABLE 91—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

College of the City of New York Retirement Fund

Number Exposed to Risk.....	1,383
Total Number of Separations.....	89
Total Withdrawals.....	80
Resignations.....	80
Dismissals.....	..
Total Deaths.....	6
Total Separations by Disability.....	..
Total Service Retirements.....	3

TABLE 92—SUMMARY OF EXPOSURE—SALARY

College of The City of New York Retirement Fund

Class	Number of Annual Salaries	Total Payroll
Active Members.....	1,003	\$2,073,750
Pensioned Members.....	8	12,100
Total.....	1,011	\$2,085,850

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, a diagram is given on page 170 showing the rates plotted on cross section paper.

TABLE 93—RATES OF SEPARATION FROM ACTIVE SERVICE

College of the City of New York Retirement Fund

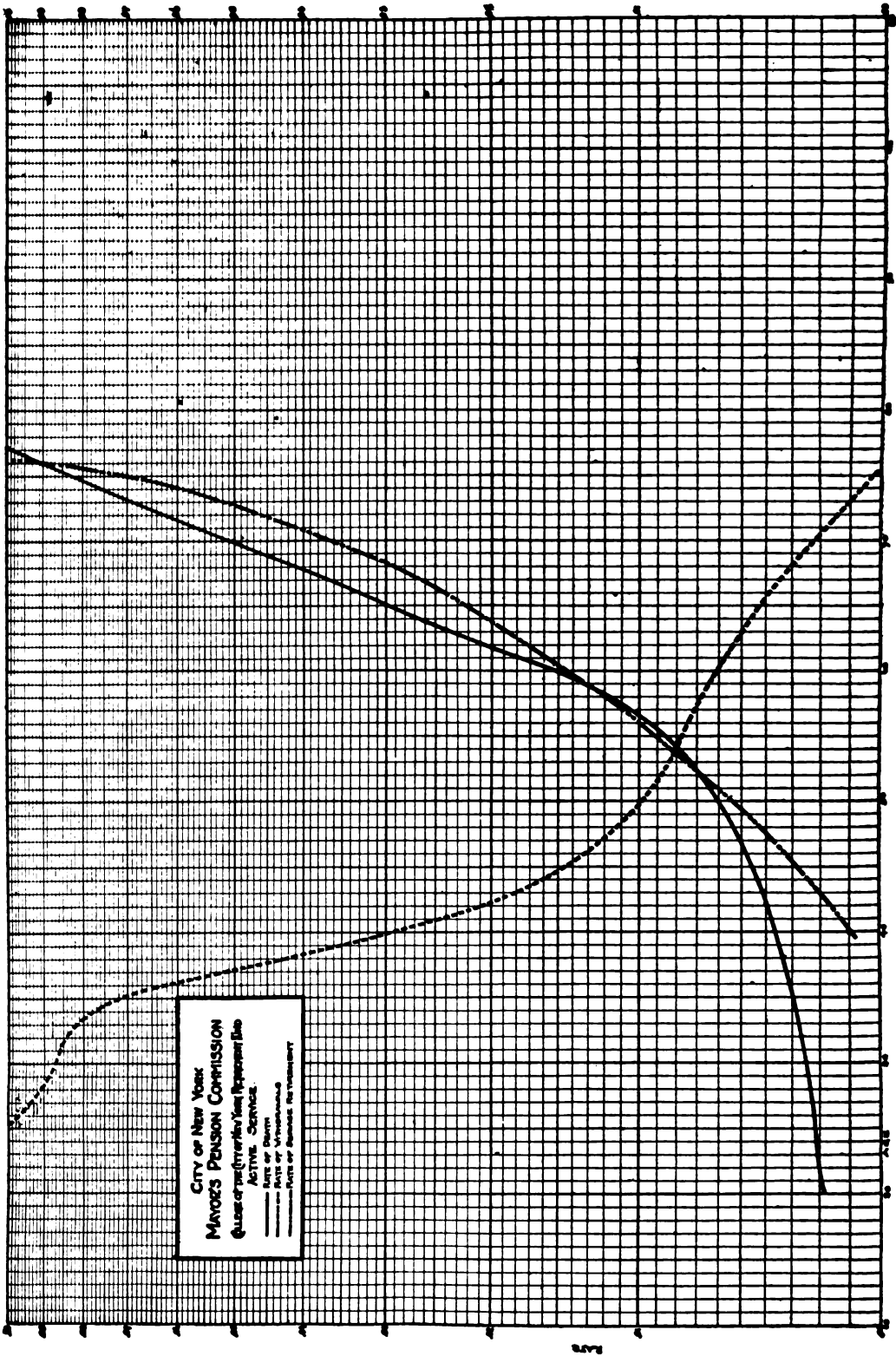
Age	Rate of Withdrawal $w_{(a)} q_z$	Rate of Death $d_{(a)} q_z$	Rate of Service Retirement $o_r q_z^{(a)}$	Age	Rate of Withdrawal $w_{(a)} q_z$	Rate of Death $d_{(a)} q_z$	Rate of Service Retirement $o_r q_z^{(a)}$
20	.1240	.0019	...	51	.0094	.0066	.0062
21	.1220	.0020	...	52	.0088	.0070	.0060
22	.1189	.0020	...	53	.0085	.0075	.0076
23	.1140	.0021	...	54	.0082	.0081	.0083
24	.1080	.0021	...	55	.0077	.0088	.0092
25	.1024	.0022	...	56	.0075	.0097	.0101
26	.0975	.0023	...	57	.0071	.0106	.0111
27	.0937	.0023	...	58	.0068	.0119	.0122
28	.0908	.0024	...	59	.0065	.0135	.0134
29	.0888	.0025	...	60	.0063	.0155	.0147
30	.0876	.0026	...	61	.0057	.0181	.0161
31	.0863	.0026	...	62	.0054	.0212	.0176
32	.0842	.0027	...	63	.0050	.0242	.0191
33	.0818	.0028	...	64	.0047	.0272	.0209
34	.0780	.0029	...	65	.0044	.0303	.0227
35	.0723	.0030	...	66	.0039	.0336	.0247
36	.0628	.0032	...	67	.0036	.0372	.0268
37	.0528	.0033	...	68	.0033	.0412	.0297
38	.0435	.0034	...	69	.0027	.0456	.0328
39	.0358	.0036	...	70	.0024	.0502	.0363
40	.0294	.0037	.0010	71	.0019	.0558	.0408
41	.0248	.0039	.0013	72	.0016	.0620	.0458
42	.0213	.0040	.0017	73	.0013	.0690	.0521
43	.0184	.0042	.0021	74	.0007	.0762	.0607
44	.0164	.0044	.0024	75	.0003	.0838	.0724
45	.0147	.0046	.0028	76	...	.0913	.0936
46	.0135	.0049	.0033	77	...	.0998	.1350
47	.0122	.0052	.0038	78	...	.1090	.2400
48	.0112	.0055	.0043	79	...	.1188	.4900
49	.0106	.0058	.0049	80	...	.1288	.7440
50	.0100	.0061	.0055	81	...	.1400	.8600

RATES OF RESIGNATION AND DISMISSAL

Practically no dismissals occur in the experience for the College of the City of New York, therefore but one rate of withdrawal was prepared. This rate, which is comparable with the total rates of withdrawal of the other services, is exceeded only by the rates for the Health Department and for the clerks and the laborers under the City of New York Employees' Retirement Fund. In the earlier ages the rates rank even higher than the rates for some of the classes mentioned, but after about age 35 it falls below these rates.

Although this high rate of separation from the service may be explained to some extent by the fact that no provision is made for disability retirement in the earlier ages, probably the most important cause of separation is the nature of the profession itself. Evidently many young men enter the service of the College of the City of New York and remain in it for a short time, and then leave to take teaching positions in other colleges or to enter upon some other business or professional career.

Although no outside rates were at hand for comparison the Commission was in a position to make some general tests of the rate by the use of statistics covering other colleges, which tended to corroborate the rate found for this service.



RATE OF DEATH

The death rate of the City College is as a whole the lowest in the city services,—the next higher rate being that for men school teachers in the Teachers' Retirement Fund. The rates for the three teaching groups,—namely, men and women in the elementary and high schools and members of the City College, are lower than those for any other of the city services. The explanation doubtless is that the teachers, a group well equipped to know and apply the general rules of healthful living, are engaged in a healthful occupation, granting long vacations and paying salaries that, as compared with those in other branches of the city service, are high, and that in consequence as a class they are better able to maintain themselves in good health than are the other employees of the city service.

In the earlier ages the mortality rate for the teachers in City College is slightly lower than that for the general men school teachers, but after about age 40 it rises somewhat above the latter rate. In general the death rate lies between the rate for the men teachers of New York City and a rate developed from the mortality experience of the English and Scottish men teachers participating in the "Elementary School Teachers' Deferred Annuity Fund."

RATE OF DISABILITY

As no pension is granted because of disability no cases of disability were reported and no rate developed.

RATE OF SERVICE RETIREMENT

The rate of service retirement in the College of the City of New York is one of the lowest rates found in the city services. In fact the only lower rates are those for laborers and for street cleaners. Possibly the reason why the rates for these two classes are lower is that few persons remain in the latter services long enough to become eligible for retirement. In the City College the low retirement rate is probably explainable not from the fact that the employees are ineligible for retirement, but from the fact that they do not care to retire. The salaries in this service apparently increase more rapidly than in any other service and the member probably prefers to retain his position rather than to go on the retirement roll.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

As the actual experience was insufficient to afford a reliable basis for a rate of mortality McClintock's Annuity Table for men was used. This table has been adopted by the Insurance Department of New York as the standard for valuing the annuities sold by the insurance companies of the state. The rates of mortality from that table are not reproduced here, but they are shown in the discussion of rates for pensioners of the Supreme Court, First Department, pension fund, page 284.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following active service table is based on the rates given on page 169; the mortality table for pensioners, which was used, is Table 155, shown on page 287 of the discussion of the pension fund of the Supreme Court, First Department.

TABLE 94—ACTIVE SERVICE TABLE AND SALARY SCALE

College of The City of New York Retirement Fund

Age	Living $l_x^{(a)}$	With- drawals $w_x^{(a)}$	Deaths $d_x^{(a)}$	Retire- ments $r_x^{(a)}$	Total Decrement	Salary Scale s_x	Age	Living $l_x^{(a)}$	With- drawals $w_x^{(a)}$	Deaths $d_x^{(a)}$	Retire- ments $r_x^{(a)}$	Total Decrement	Salary Scale s_x
20	1,000,000	124,000	1,900	...	125,900	500	51	115,214	1,083	755	714	2,552	2,750
21	874,100	106,640	1,713	...	108,353	578	52	112,662	992	790	777	2,559	2,780
22	765,747	91,047	1,539	...	92,586	670	53	110,103	936	828	837	2,601	2,830
23	673,161	76,740	1,400	...	78,140	815	54	107,502	882	874	892	2,648	2,870
24	595,021	64,262	1,262	...	65,524	990	55	104,854	807	925	965	2,697	2,905
25	529,497	54,220	1,160	...	55,380	1,110	56	102,157	766	988	1,032	2,786	2,940
26	474,117	46,226	1,067	...	47,293	1,208	57	99,371	706	1,056	1,103	2,865	2,975
27	420,824	39,993	986	...	40,979	1,295	58	96,506	656	1,150	1,177	2,983	3,010
28	385,845	35,035	922	...	35,957	1,379	59	93,523	608	1,203	1,253	3,124	3,040
29	349,888	31,070	868	...	31,938	1,457	60	90,399	569	1,245	1,329	3,303	3,070
30	317,950	27,852	811	...	28,663	1,530	61	87,090	497	1,572	1,402	3,471	3,090
31	289,237	24,065	764	...	25,729	1,610	62	83,625	451	1,769	1,472	3,602	3,130
32	263,558	22,192	717	...	22,909	1,680	63	79,933	400	1,934	1,527	3,861	3,150
33	240,649	19,685	681	...	20,366	1,752	64	76,072	358	2,009	1,590	4,017	3,170
34	220,283	17,182	646	...	17,828	1,822	65	72,055	317	2,183	1,636	4,136	3,195
35	202,455	14,638	615	...	15,253	1,889	66	66,719	265	2,282	1,678	4,225	3,230
36	187,202	11,750	592	...	12,348	1,958	67	63,694	229	2,370	1,707	4,306	3,245
37	174,854	9,432	574	...	9,806	2,020	68	59,388	196	2,444	1,764	4,404	3,270
38	165,048	7,180	561	...	7,741	2,080	69	54,984	148	2,507	1,804	4,459	3,280
39	157,307	5,032	558	...	6,190	2,140	70	50,525	121	2,537	1,834	4,492	3,300
40	151,117	4,443	558	151	5,152	2,200	71	46,033	88	2,566	1,878	4,532	3,320
41	145,905	3,600	503	190	4,373	2,260	72	41,501	66	2,573	1,901	4,540	3,340
42	141,592	3,016	569	241	3,826	2,310	73	36,961	48	2,550	1,926	4,524	3,355
43	137,766	2,535	580	289	3,404	2,355	74	32,437	23	2,470	1,969	4,462	3,370
44	134,362	2,204	594	332	3,120	2,410	75	27,975	8	2,343	2,026	4,377	3,380
45	131,242	1,930	600	368	2,906	2,460	76	23,598	...	2,154	2,209	4,303	3,395
46	128,336	1,733	628	423	2,784	2,510	77	19,235	...	1,920	2,596	4,516	3,410
47	125,552	1,532	646	477	2,655	2,560	78	14,719	...	1,604	3,533	5,137	3,430
48	122,807	1,376	671	529	2,576	2,605	79	9,582	...	1,139	4,695	5,834	3,440
49	120,321	1,275	694	590	2,559	2,655	80	3,748	...	483	2,788	3,271	3,455
50	117,762	1,177	723	648	2,548	2,705	81	477	...	67	410	477	3,460

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The present value of the benefit was developed from the preceding service and mortality table. The following table shows the present value of total salary to be earned during active service on a basis of entrance salary of \$1,000, and the present value of a pension of final salary in terms of an entrance salary of \$1,000 upon event of the single condition upon which pension is payable, as given in the enumeration of benefits and contributions.

TABLE 95—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUE OF THE PENSION BENEFIT PAYABLE TO THESE MEMBERS BASED ON AN ENTRANCE SALARY OF \$1,000

College of The City of New York Retirement Fund

Age at Entrance	Total Future Salary	Pension to Members Upon Service Retirement	Age at Entrance	Total Future Salary	Pension to Members Upon Service Retirement
20	\$18,433	\$313	35	\$16,171	\$675
25	14,008	322	40	16,985	848
30	14,445	462	..	...	...

The expectations of life and the present value of a pension of one to pensioners are of course the same as those shown for pensioners of the Supreme Court, First Department, which are presented on page 289.

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number and salaries of employees, by age and length of service, and the number and pensions of pensioners by age on the roll as of June 30, 1914:

TABLE 96—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

College of the City of New York Retirement Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
20	1	\$900	218	\$484,100	48	4	\$13,250	40	\$135,550
21	..	...	217	483,200	49	2	4,850	36	122,300
22	3	2,300	217	483,200	50	3	9,750	34	117,450
23	6	4,750	214	480,900	51	4	13,750	31	107,700
24	1	1,100	208	476,150	52	2	6,600	27	93,950
25	2	2,200	207	475,050	53	2	4,450	25	87,350
26	2	1,600	205	472,850	54	2	5,500	23	82,900
27	5	5,550	203	471,250	55	..	...	21	77,400
28	8	11,700	198	465,700	56	1	3,750	21	77,400
29	8	11,150	190	454,000	57	..	...	20	73,650
30	9	14,900	182	442,850	58	..	...	20	73,650
31	10	17,800	173	427,950	59	1	4,000	20	73,650
32	9	15,950	163	410,150	60	3	6,700	19	69,650
33	8	13,600	154	394,200	61	1	5,000	16	62,950
34	7	14,300	146	380,600	62	1	1,700	15	57,950
35	6	12,100	139	366,300	63	1	2,750	14	56,250
36	11	24,000	133	354,200	64	1	1,900	13	53,500
37	7	16,500	122	330,200	65	2	8,750	12	51,600
38	11	22,350	115	313,700	66	..	...	10	42,850
39	7	20,000	104	291,350	67	2	8,500	10	42,850
40	3	5,500	97	271,350	68	1	2,750	8	34,350
41	7	19,800	94	265,850	69	2	6,200	7	31,600
42	13	27,000	87	246,050	70	..	...	5	25,400
43	8	19,300	74	219,050	71	1	2,400	5	25,400
44	6	19,900	66	199,750	72	1	5,000	4	23,000
45	8	17,850	60	179,850	73	..	...	3	18,000
46	8	18,100	52	162,000	74	2	10,500	3	18,000
47	4	8,350	44	143,900	75	1	7,500	1	7,500

TABLE 97—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

College of the City of New York Retirement Fund

Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	2	\$1,500	218	\$484,100	16	1	\$2,200	46	\$159,100
1	10	9,750	216	482,600	17	4	11,750	45	156,900
2	3	3,600	206	472,850	18	5	16,750	41	145,150
3	10	10,550	203	469,250	19	3	8,200	36	128,400
4	6	10,050	193	458,700	20	1	2,750	33	120,200
5	12	17,700	187	448,650	21	3	8,950	32	117,450
6	6	10,300	175	430,950	22	1	2,750	29	108,500
7	24	42,900	169	420,650	23	3	8,500	28	105,750
8	19	35,100	145	377,750	24	3	9,650	25	97,250
9	16	31,600	126	342,650	25	1	4,000	22	87,600
10	17	38,050	110	311,050	26	1	3,500	21	83,600
11	14	32,200	93	273,000	27	2	7,000	20	80,100
12	11	24,850	79	240,800	28	4	12,350	18	73,100
13	13	37,100	68	215,950	29	2	5,500	14	60,750
14	3	6,400	55	178,850	30 & over	12	55,250	12	55,250
15	6	13,350	52	172,450					

TABLE 98—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

College of the City of New York Retirement Fund

Age	Number	Pensions	Age	Number	Pensions
71	1	\$1,000	78	...	...
72	1	700	79	...	...
73	...	...	80	...	...
74	...	...	81	1	\$1,630
75	1	1,000			
76	...	...	
77	...	...	Total...	4	\$4,330

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets of June 30, 1914, and shows the complete financial condition of the fund

**TABLE 99—A VALUATION OF ASSETS AND LIABILITIES OF THE
FUND—VALUED AS**

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 4 Service Pensioners now on the pension roll of the fund on annual pensions aggregating \$4,330.....	\$24,152
Total Pensions Entered Upon.....	\$24,152
Pensions to such Employees as will retire from the present active force of 218 members.....	\$480,067
Total Pensions Not Entered Upon.....	\$480,067
Grand Total.....	\$504,219

and liabilities of the College of the City of New York Retirement Fund as
as of that date:

**COLLEGE OF THE CITY OF NEW YORK RETIREMENT
OF JUNE 30, 1914**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand.....	\$5,054
Contribution by Employees.....	...
*Deficiency.....	499,165
Grand Total.....	\$504,219

*NOTE—The law provides that pensions may be paid out of the excise moneys, but, as no definite limit is placed on the amount of the excise moneys which may be used for this purpose, no estimate of the return from this source has been made.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death. This table is based on the mortality table of pensioners and does not take into account the interest factor, which does not affect the appropriation if the amounts to pay pensions are appropriated as the pensions become payable.

TABLE 100—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

College of the City of New York Retirement Fund

Year After Valuation	*Date	Service Pensions	Year After Valuation	*Date	Service Pensions
0	1914	\$4,103	14	1928	\$384
1	1915	3,690	15	1929	294
2	1916	3,294	16	1930	222
3	1917	2,915	17	1931	163
4	1918	2,558	18	1932	118
5	1919	2,225	19	1933	83
6	1920	1,916	20	1934	56
7	1921	1,634	21	1935	37
8	1922	1,379	22	1936	24
9	1923	1,150	23	1937	15
10	1924	949	24	1938	9
11	1925	773	25	1939	5
12	1926	621	26	1940	3
13	1927	492	27	1941	1
Total.....					\$29,113

*Date year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the College of the City of New York, expressed as a percentage of the employee's salary.

TABLE 101—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE PENSION BENEFIT OF THE COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Age at Entrance	Total Pension	Age at Entrance	Total Pension	Age at Entrance	Total Pension	Age at Entrance	Total Pension
20	1.70	26	2.46	31	3.40	36	4.36
21	1.79	27	2.63	32	3.59	37	4.53
22	1.90	28	2.82	33	3.79	38	4.69
23	2.01	29	3.00	34	4.00	39	4.85
24	2.15	30	3.20	35	4.17	40	4.99
25	2.30	..	...	..	...	..	...

CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the City of New York Employees' Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

Upon disability after 30 years' service, a pension of not more than one-half of average of last three years' salary.

If employees are veterans of Civil War, a service of 20 years is sufficient.

Because of lack of sufficient experience the average allowance used was 50 per cent. of average of last three years' salary.

Contributions

By EMPLOYEES

No contributions.

By CITY

Indirect contributions:

Proportion of excise taxes as required to pay maturing pensions.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of separation through disability

Rate of change of salary

Rate of death of pensioners.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The City of New York Employees' Retirement Fund covers any officer, clerk or other employee in the service of the City of New York who is not entitled to share, or who has not elected to share, in any of the departmental funds. All schedules not to be used under any other fund were therefore assembled for use in this valuation. The following table gives the departments represented by these schedules. The only schedules not included in the valuation are those representing hospital helpers and pupil nurses who had had less than a year of service and whose salary was less than \$360. The probability of these employees fulfilling the requirement of thirty years of service prior to retirement with pension is slight

and the effect on the total liability, made by excluding them from the valuation, is hardly appreciable.

DEPARTMENTS REPRESENTED BY EMPLOYEES COVERED BY NEW YORK CITY EMPLOYEES' RETIREMENT FUND

Name of Department	Name of Department
Accounts, Commissioner of	Fire
Ambulance Service, Board of	*Health
Armory Board	*Hunter College
Art Commission	Inebriety, Board of
Assessors, Board of	Jurors, Commission of
*Bellevue and Allied Hospitals	Law
Borough Presidents	Licenses
Bridges	Mayor's Office
City Chamberlain	Municipal Civil Service Commission
City Record, Board of	Parks
College of the City of New York	Parole, Board of
Coroners	Plumbers, Examining Board of
Correction	Police
*County Clerks	Public Administrator
Courts—City	*Public Charities
Courts—County	Public Recreation Commission
*Court of General Sessions	Public Service Commission
Courts of the City of New York—Municipal	Records, Commissioner of
Court of Special Sessions	Register's Office
*Court—Supreme	School—Brooklyn District Training
Courts—Surrogates'	Sheriff's Office
*District Attorney	Sinking Fund, Commissioner of
Docks and Ferries	*Street Cleaning
Education	Taxes and Assessments
*Elections, Board of	Tenement House
Estimate and Apportionment, Board of	Water Supply, Board of
Examiners, Board of	Water Supply, Gas and Electricity
Finance	Weights and Measures

* In checking the number of schedules in this department, there was some doubt as to the actual number of withdrawals, in the period of experience. It seemed advisable to omit these schedules from the actual experience tables. These schedules were, however, included in the valuation.

Schedules representing the exempt, the elected and the appointed employees in the departments shown above were not used in developing rates, since the positions of these employees differ somewhat from those of the general employees who form the main basis of the experience. These classes were all included in the valuation, but the amount of liability due to them was computed separately in order that the exact cost of including them in the pension system might be known.

Special methods of handling data

The employees included under this fund, as has been shown, represent approximately every department of the city service and, therefore, represent widely varying occupations and salaries. To include the data for all these employees in one experience tabulation and to derive basic rates from it did not seem advisable, since the rates could not have been regarded as measuring the contingencies to which each member of the fund is subject. It was finally decided, therefore, for reasons given on page 19, to distribute the schedules into three broad divisions by occupation, defined as follows:

1. Clerks, administrative officers and technical employees. This class includes about 45% of the total number of employees considered under the

fund and represents over three hundred different administrative, clerical and technical positions. All employees included under this class are hereafter referred to as clerks.

2. Laborers. This class includes employees engaged in what is regarded as unskilled labor and embraces approximately 37% of the total number of employees considered. About 113 specific occupations are represented according to the civil service list.

3. Mechanics. This class includes about 18% of the total number of employees covered by this fund and embraces about 110 occupations.

Originally it was planned to divide further the two classes, clerks and laborers, according to sex and to develop separate rates for men clerks and women clerks, for men laborers and women laborers. After the schedules were divided it was found, however, that the salaries received by women clerks formed only 10% of the total salaries of clerks and that the salaries of women laborers formed only 5% of the total salaries of laborers. A slight addition to or subtraction from the measure of liability to provide for the presence of women clerks and women laborers could therefore make only a slight difference in the total liability involved under their respective classes and a relatively small difference in the total liability involved under the fund. For this reason it was considered sufficiently exact to obtain the liability due to women clerks and to women laborers by the use of the rates for men clerks and men laborers, because in this way much labor could be saved in the graduation of rates.

Actual experience sheets were at first tabulated in the aggregate form for the three classes, men clerks, men laborers and mechanics, but these tabulations indicated for each division such high total rates of separation from active service that it became apparent that aggregate rates could not be satisfactorily employed in the construction of service tables. Tabulations of the experience were then made for each division in a select form in which the separations occurring in the first three years of service were tabulated by individual years and only those separations occurring after the third year were combined. The gross rate of separation was accordingly reduced approximately for clerks from about 33% in the first year of service to 6% after three completed years of service; for laborers from about 32% in the first year of service to 6% after three completed years of service; for mechanics from about 35% in the first year of service to 5% after three completed years of service.

The table on page 182 shows for the active service of each class the extent of the exposure used and the actual number of separations, classified by cause, occurring in the first three years of service and after three completed years of service.

Of the total separations occurring in the first year of service 85% were resignations and 12% dismissals among clerks; 67% were resignations and 28% dismissals among laborers, and 79% were resignations and 18% dismissals among mechanics. Of the separations occurring after three years of service had been completed the proportion found by resignations was reduced to 57% among clerks; to 34% among laborers, and to 49% among mechanics; the proportion found by dismissals was reduced to 12% among clerks; to 24% among laborers, and to 15% among mechanics. The num-

**TABLE 102—SUMMARY OF EXPOSURE AND SEPARATIONS—
ACTIVE SERVICE**

City of New York Employees' Retirement Fund

CLASS	Years of Service	Exposed to Risk	WITHDRAWALS			Deaths	Service Retirements*	Total Separations
			Resignations	Dismissals	Total			
Clerks	One	8,698.5	2,424	341	2,765	75	..	2,840
	Two	5,493.5	601	72	673	52	..	725
	Three	4,049.5	309	49	358	42	..	400
	Ultimate	30,083.5	1,059	228	1,287	529	40	1,856
	Total	48,925.0	4,393	690	5,083	698	40	5,821
Laborers	One	9,041.5	2,041	842	2,883	141	..	3,024
	Two	6,293.5	522	247	769	100	..	869
	Three	5,657.	283	130	413	115	..	528
	Ultimate	41,162.5	873	626	1,499	1,021	39	2,559
	Total	62,154.5	3,719	1,845	5,564	1,377	39	6,980
Mechanics	One	5,071.	1,390	313	1,703	56	..	1,759
	Two	3,271.5	323	75	398	29	..	427
	Three	2,964.	188	38	226	35	..	261
	Ultimate	22,081.5	548	173	721	369	31	1,121
	Total	33,388.0	2,449	599	3,048	489	31	3,568

*These are Technically Disability Retirements but on account of Service Limitation, they were used as Service Retirements.

ber of separations by death do not show, however, a marked variation with the first few years of service. It was assumed, therefore, that the rates of resignation and dismissal only were primarily affected by years of service, and accordingly the select rates of resignation and dismissal were graduated directly from the data, while the select rate of death was obtained from the ultimate rate by the method previously described on page 29.

Certain adjustments in the rate were necessary because of the fact that the pension act was originally limited to the Department of Finance and was not amended to include all employees until 1911. The experience regarding retirement could therefore be used only as an indication of the general tendency of the rate and as a guide in the selection of a rate of retirement for adoption in the manner described in the discussion pertaining to the rate in question.

On the adoption of the rate of retirement the rates of resignation and of dismissal for each class were reduced on the theory that certain separations from service which had in the past necessarily taken place as resignations would in the future take place as retirements.

The laws controlling this fund do not provide for retirement on account of disability for employees with less than thirty years of service, and thus employees becoming disabled prior to completion of thirty years of service leave the service through resignation or dismissal. It is very probable, therefore, that many cases of resignation recorded in the experience were actually cases of disability. On this assumption it seemed advisable to introduce a rate of disability. A rate was therefore adopted and the rates of resignation and dismissal were further reduced to allow for it. For

purposes of the present valuation this rate is to be considered only as a part of the withdrawal rate, but it may be useful in approximating the cost in case the introduction of a provision by which a disability pension is granted without service limitation.

The experience regarding the rate of salary change was prepared and used in accordance with the general methods described in section I. The following table shows the extent of the experience available for use:

TABLE 103—SUMMARY OF EXPOSURE—SALARY

City of New York Employees' Retirement Fund

CLASS	CLERKS		LABORERS		MECHANICS	
	Number of Annual Salaries	Total Payroll	Number of Annual Salaries	Total Payroll	Number of Annual Salaries	Total Payroll
Active Members:						
Men.....	33,753	\$46,695,770	42,466	\$33,651,610	23,824	\$35,928,090
Women.....	4,927	4,746,000	2,554	1,125,330	...	...
Pensioned Members:						
Men.....	104	206,260	133	125,300	107	177,260
Women.....	8	4,500	5	4,500	...	...
Total.....	38,792	\$51,652,530	45,158	\$34,906,740	23,931	\$36,105,350

The experience in regard to pensions was so incomplete that no tabulations were made summarizing it.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

Rates developed on a select basis are compared first with rates developed on the same basis and then with aggregate rates. In order to make comparison with aggregate rates the select and ultimate rates have been respectively multiplied into a standard service exposure, which has been subdivided by years of service, and the expected cases of separation obtained in this way have been contrasted with the cases obtained by use of the comparative aggregate rate and the same exposure. This method is explained in detail on pages 392 and 393.

The active service—clerks

The following table shows the rates that were used for clerks among the members of the City of New York Employees' Retirement Fund. As has been stated, these rates were based on the experience of men, but used for both men and women. To visualize the increases and decreases in these rates from age to age and to show their relative importance at various ages, diagrams showing the rates plotted on cross section paper are given on pages 188 to 190.

TABLE 104—RATES OF SEPARATION FROM ACTIVE SERVICE
City of New York Employees' Retirement Fund—Clerks

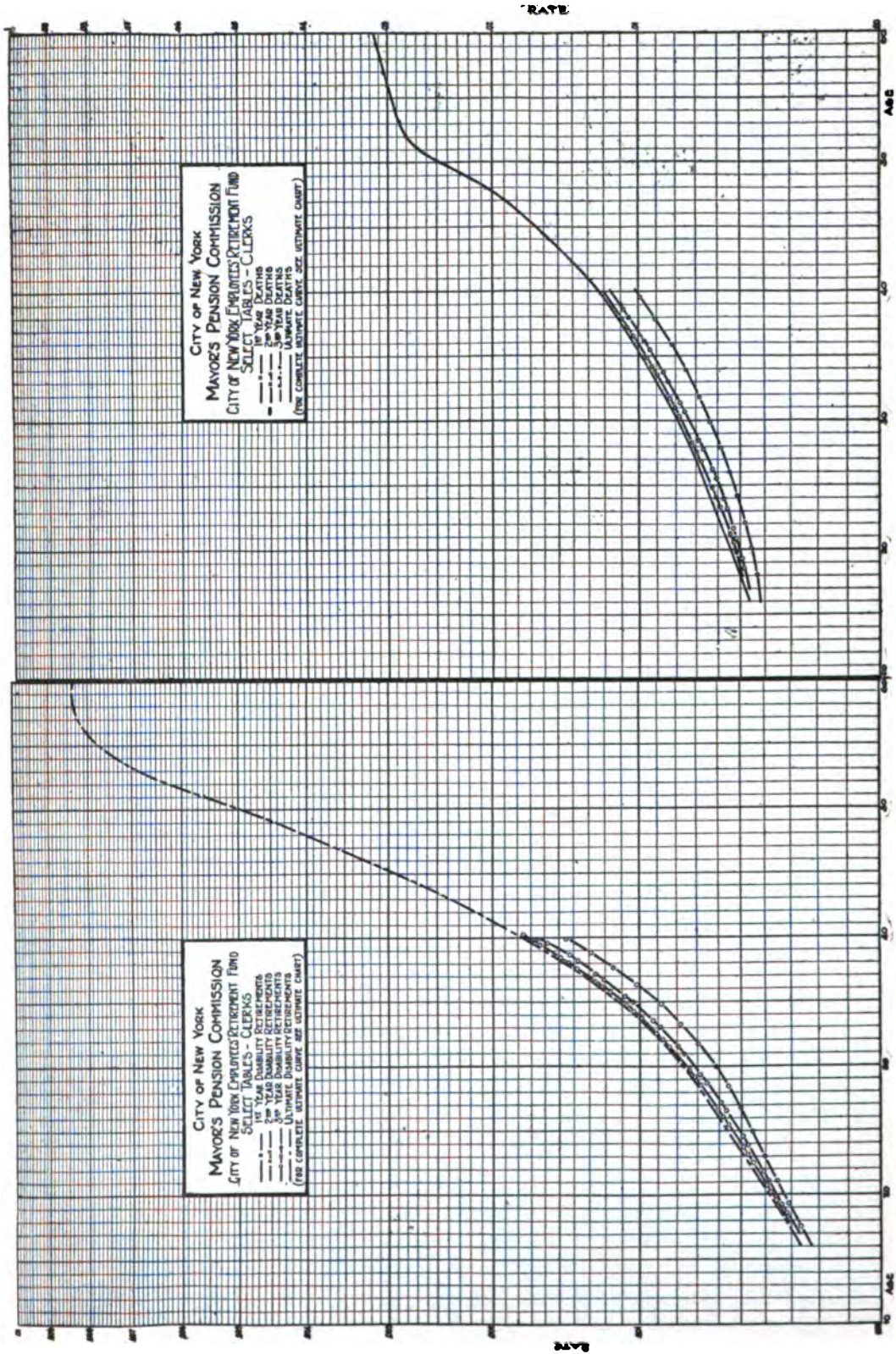
AGE	RATES OF WITHDRAWAL						
	RESIGNATION			DISMISSAL			
	$r_w q_{[x]}$	$r_w q_{[x-1]+1}$	$r_w q_{[x-2]+2}$	$r_w q_{[x]}$	$r_w q_{[x-1]+1}$	$r_w q_{[x-2]+2}$	TOTAL ULTIMATE $w q_x^{(a)}$
16	.0749	...	...	.0138	...	...	...
17	.0880	.0712	...	.0142	.0099	...	...
18	.1010	.0808	.0630	.0147	.0100	.0079	...
19	.1120	.0875	.0777	.0151	.0101	.0080	.0661
20	.1220	.0931	.0910	.0159	.0102	.0081	.0673
21	.1300	.0971	.0931	.0167	.0104	.0083	.0677
22	.1370	.1010	.0949	.0175	.0107	.0086	.0676
23	.1425	.1038	.0958	.0184	.0109	.0088	.0669
24	.1473	.1058	.0961	.0193	.0112	.0090	.0662
25	.1515	.1069	.0960	.0206	.0116	.0092	.0655
26	.1548	.1072	.0955	.0217	.0119	.0094	.0647
27	.1571	.1071	.0948	.0228	.0122	.0098	.0639
28	.1590	.1069	.0939	.0238	.0126	.0099	.0630
29	.1605	.1058	.0920	.0248	.0130	.0101	.0620
30	.1610	.1041	.0901	.0258	.0133	.0103	.0610
31	.1609	.1021	.0879	.0266	.0138	.0106	.0599
32	.1602	.0997	.0852	.0274	.0140	.0108	.0587
33	.1590	.0966	.0828	.0282	.0144	.0109	.0575
34	.1570	.0931	.0808	.0289	.0147	.0111	.0560
35	.1541	.0889	.0780	.0295	.0150	.0112	.0543
36	.1511	.0849	.0758	.0299	.0152	.0112	.0538
37	.1472	.0808	.0730	.0301	.0153	.0113	.0510
38	.1430	.0760	.0690	.0303	.0156	.0114	.0489
39	.1350	.0720	.0652	.0304	.0157	.0113	.0465
40	.1322	.0677	.0620	.0303	.0157	.0112	.0445
41	...	.0635	.0602	...	.0156	.0111	.0411
42	...	...	.0581	...	...	.0110	.0383
43	...	...	...	...	...	...	.0354
44	...	...	...	...	...	...	.0349
45	...	...	...	...	...	...	.0306
46	...	...	...	...	...	...	.0284
47	...	...	...	...	...	...	.0264
48	...	...	...	...	...	...	.0244
49	...	...	...	...	...	...	.0226
50	...	...	...	...	...	...	.0209
51	...	...	...	...	...	...	.0191
52	...	...	...	...	...	...	.0174
53	...	...	...	...	...	...	.0157

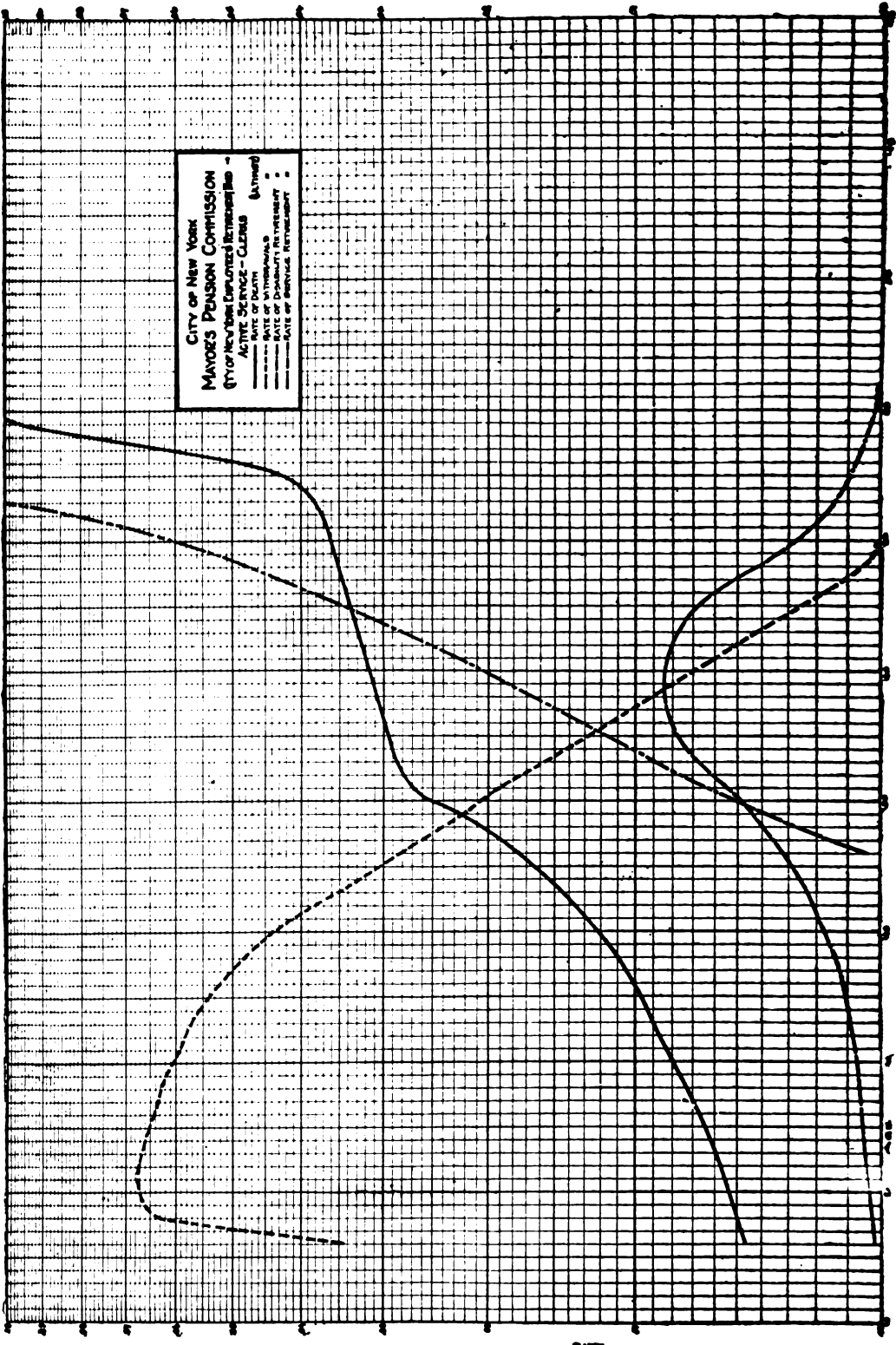
TABLE 104—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund—Clerks

AGE	RATES OF DEATH				RATES OF DISABILITY				WIFE PENSION ${}^wq_s^{(a)}$
					WITHOUT PENSION				
	${}^d q_{[x]}^{(a)}$	${}^d q_{[x-1]+1}^{(a)}$	${}^d q_{[x-2]+2}^{(a)}$	${}^d q_s^{(a)}$	${}^d q_{[x]}^{(a)}$	${}^d q_{[x-1]+1}^{(a)}$	${}^d q_{[x-2]+2}^{(a)}$	${}^d q_s^{(a)}$	
16	.0042	...	...	...	.0002	...	...	...	...
17	.0044	.0046	...	...	.0003	.0003	...	...	...
18	.0045	.0048	.0050	...	.0003	.0003	.0003	...	...
19	.0046	.0050	.0051	.0052	.0003	.0003	.0003	.0004	...
20	.0047	.0051	.0053	.0054	.0003	.0004	.0004	.0004	...
21	.0048	.0053	.0055	.0056	.0004	.0004	.0004	.0004	...
22	.0049	.0054	.0057	.0058	.0004	.0004	.0004	.0005	...
23	.0050	.0056	.0059	.0060	.0004	.0004	.0005	.0005	...
24	.0052	.0058	.0061	.0063	.0004	.0005	.0005	.0005	...
25	.0053	.0060	.0063	.0065	.0005	.0005	.0006	.0006	...
26	.0055	.0062	.0066	.0068	.0005	.0006	.0006	.0006	...
27	.0057	.0065	.0069	.0071	.0005	.0006	.0006	.0006	...
28	.0059	.0068	.0072	.0074	.0005	.0006	.0007	.0007	...
29	.0062	.0071	.0075	.0077	.0006	.0007	.0007	.0007	...
30	.0064	.0074	.0079	.0080	.0006	.0007	.0008	.0008	...
31	.0067	.0077	.0082	.0084	.0007	.0008	.0008	.0008	...
32	.0070	.0081	.0086	.0087	.0007	.0008	.0009	.0009	...
33	.0073	.0084	.0089	.0091	.0008	.0009	.0010	.0010	...
34	.0076	.0088	.0093	.0095	.0008	.0010	.0010	.0010	...
35	.0080	.0092	.0097	.0098	.0009	.0010	.0011	.0011	...
36	.0083	.0096	.0101	.0102	.0010	.0012	.0012	.0012	...
37	.0087	.0100	.0105	.0106	.0011	.0013	.0013	.0013	...
38	.0092	.0106	.0111	.0112	.0012	.0014	.0015	.0015	...
39	.0097	.0111	.0116	.0117	.0013	.0015	.0016	.0016	...
40	.0103	.0117	.0122	.0123	.0015	.0017	.0018	.0018	...
41	...	.0123	.0129	.0130	...	.0019	.0019	.0020	...
42	...	...	.0136	.0138	...	...	.0021	.0022	...
43	...	...	...	.0146	...	...	...	.0024	...
44	...	...	...	.0155	...	...	...	.0026	...
45	...	...	...	.0166	...	...	...	.0029	...
46	...	...	...	.0178	...	...	...	.0033	.0006
47	...	...	...	.0192	...	...	...	.0036	.0017
48	...	...	...	.0208	...	...	...	.0040	.0039
49	...	...	...	.0228	...	...	...	.0045	.0039
50	...	...	...	.0235	...	...	...	.0050	.0051
51	...	...	...	.0271	...	...	...	.0056	.0064
52	...	...	...	.0280	...	...	...	.0062	.0077
53	...	...	...	.0288	...	...	...	.0069	.0090

TABLE 104—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund—Clerks

AGE	RATES OF DEATH				RATES OF DISABILITY					
					WITHOUT PENSION					WIFE PENSION
	${}_d q_{[s]}^{(a)}$	${}_d q_{[s-1]+1}^{(a)}$	${}_d q_{[s-2]+2}^{(a)}$	${}_d q_x^{(a)}$	${}_d q_{[s]}^{(a)}$	${}_d q_{[s-1]+1}^{(a)}$	${}_d q_{[s-2]+2}^{(a)}$	${}_d q_x^{(a)}$	${}_w q_x^{(a)}$	
540292	...	...	...	.0074	.0103	
550297	...	...	...	.0078	.0118	
560301	...	...	...	.0081	.0132	
570305	...	...	...	.0083	.0149	
580308	...	...	...	.0084	.0168	
590313	...	...	...	.0084	.0184	
600318	...	...	...	.0084	.0207	
610322	...	...	...	.0083	.0230	
620327	...	...	...	.0081	.0255	
630331	...	...	...	.0078	.0283	
640335	...	...	...	.0074	.0314	
650339	...	...	...	.0069	.0348	
660344	...	...	...	.0061	.0386	
670348	...	...	...	.0052	.0428	
680353	...	...	...	.0043	.0478	
690357	...	...	...	.0035	.0535	
700361	...	...	...	.0028	.0604	
710365	...	...	...	.0023	.0696	
720371	...	...	...	.0018	.0835	
730381	...	...	...	.0015	.1030	
740398	...	...	...	.0012	.1400	
750430	...	...	...	.0010	.1850	
760498	...	...	...	.0008	.2380	
770625	...	...	...	.0006	.3025	
780702	...	...	...	.0004	.3775	
790972	...	...	...	.0003	.4575	
801170	...	...	...	.0002	.5450	
811330	...	...	...	.0001	.6400	
821500	...	...	...	...	.7300	
831670	...	...	...	...	.8350	





RATES OF RESIGNATION AND DISMISSAL

The rates of resignation and dismissal among the clerks in the City of New York Employees' Retirement Fund vary markedly, as has been stated, with years of service when the service is less than three completed years. For the first year of service the rate of resignation is the second highest of the rates developed on the select basis; the highest being that applying to members of the Health Department Pension Fund.

The ultimate rate ranks first, but when the ultimate and select rates are considered together as an aggregate rate of resignation, it ranks second highest out of seven resignation rates which were developed, being lower than the rate for the Health Department and higher than that for mechanics.

The rate of dismissal for the first year of service is next to the lowest of such rates developed on the select basis; that for the Health Department being in this case the lowest.

The ultimate rate of dismissal is, however, fourth highest, being exceeded by the rates applicable to street cleaners, laborers and mechanics. If the select and the ultimate rates are considered together as an aggregate rate of dismissal for clerks it ranks fourth or as the central one of the seven rates prepared. It is lower than that for mechanics and higher than that for policemen.

If the two aggregate rates are combined as a total aggregate rate of withdrawal, this total rate will rank second out of the eleven total withdrawal rates prepared; being exceeded by that for the Health Department and immediately followed by that for laborers. This rate is generally higher than a similar rate obtained from the experience of the salaried and professional employees of the government insurance service of New South Wales, which apparently indicates that service in New South Wales is slightly more permanent than the New York City service.

RATE OF DEATH

The rate of death among clerks in the City of New York Employees' Retirement Fund is the second highest of the eleven rates of death which were prepared, being exceeded only by that among laborers. The fact that no retirement allowance is provided for disabled clerks with less than thirty years of service probably affects the rate of death by increasing the number of deaths in the active service. In the middle period of life the difference between a rate based upon active and disabled lives combined and one based upon active lives alone,—such as is obtained in some departments where all impaired lives have been removed through disability pension, would probably be most noticeable. It is in the middle period of life that the rate of death for clerks is comparatively high.

RATE OF DISABILITY WITHOUT PENSION

The rate of separation on account of disability among clerks of the City of New York Employees' Retirement Fund, as previously stated, has been derived on the assumption that a certain number of the withdrawals, recorded as resignations, actually occurred on account of disability. Roughly, 7% of the actual ultimate cases of withdrawal among

clerks were used as withdrawals on account of disability. The rate was made to follow the general trend of the corresponding rates for the Health Department Fund and for men in the Teachers' Retirement Fund, on the assumption that employees in these departments somewhat closely resemble the group of employees for whom this rate was being derived as regards the degree of exposure to disability.

The rate of disability employed is comparatively low; ranking about eighth out of ten rates derived and lying between the rate derived for the Supreme Court, First Department, Retirement Fund, which is higher, and the rate for the Health Department Fund, which is lower.

RATE OF SERVICE RETIREMENT

For clerks the rate of retirement on pension is technically a rate of disability, since the law allows pensions only to persons who have had thirty years of service and are disabled. As this retirement provision was evidently intended to relieve the service of the ill effects of superannuation, the rate has been considered for comparative purposes as if it were simply a rate of retirement without the disability provision. The experience of the years 1913 and 1914 was taken as indicative of the general tendency of the rate; the rate itself was developed in about the same form as that of rates of retirement in similar services. The rate developed for clerks as a whole up to age 65 ranks about ninth out of twelve rates prepared and lies between the rate for mechanics, which is higher, and the rate for members of the College of the City of New York, which is slightly lower.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the averaging salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

The active service—laborers

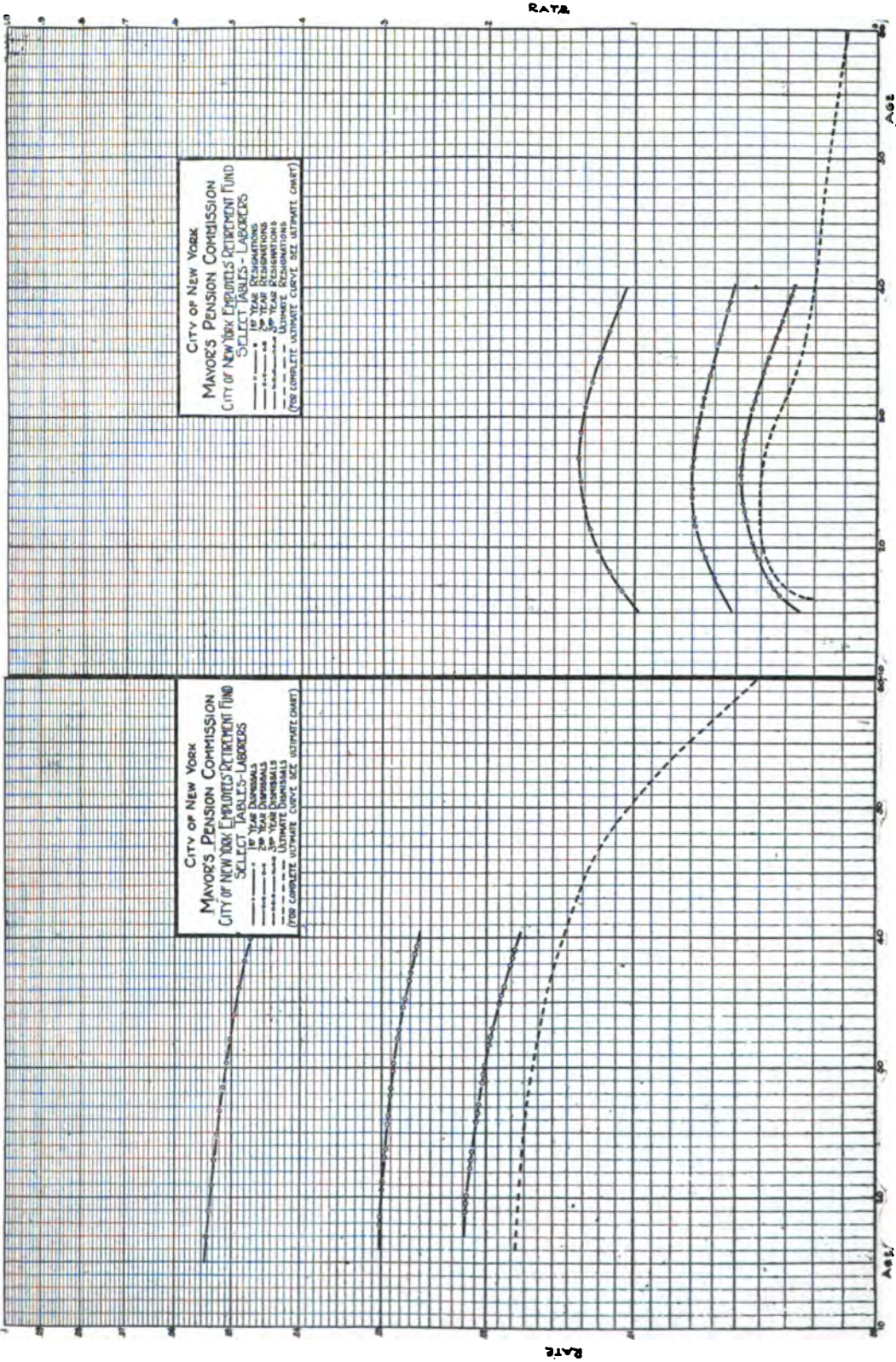
The following table shows the rates that were used for the laborers in the City of New York Employees' Retirement Fund. For reasons previously stated these rates were based on the experience for men but were used for both men and women. To visualize the increases and decreases in these rates from age to age, diagrams showing the rates plotted on cross section paper are given on pages 197 to 199.

TABLE 105—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund, Laborers

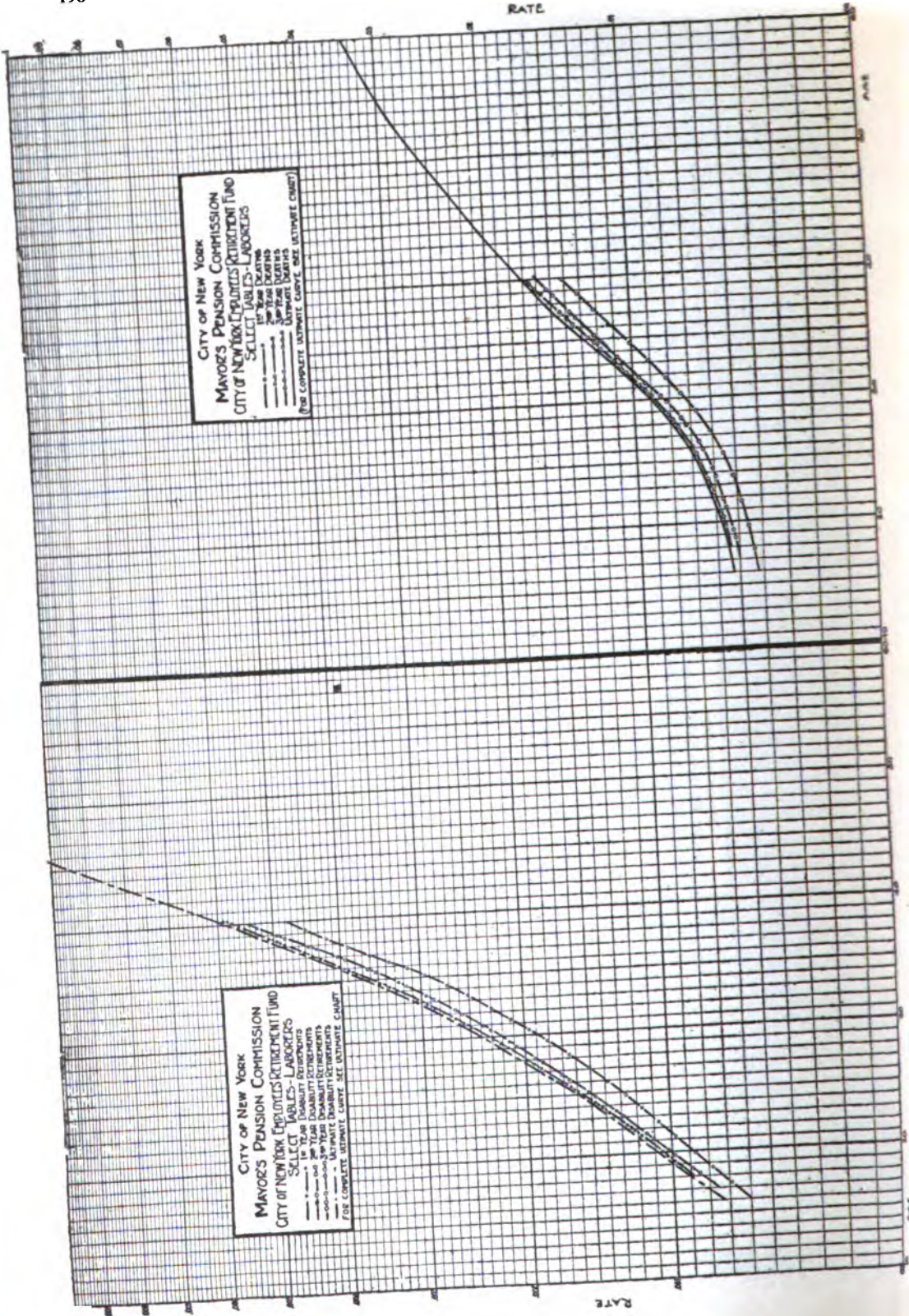
AGE	RATES OF WITHDRAWAL							TOTAL ULTIMATE
	RESIGNATION			DISMISSAL				
	$r_wq_x^{(a)}$	$r_wq_{[x-1]+1}^{(a)}$	$r_wq_{[x-2]+2}^{(a)}$	$r_wq_x^{(a)}$	$d_wq_{[x-1]+1}^{(a)}$	$d_wq_{[x-2]+2}^{(a)}$	$d_wq_x^{(a)}$	
540132	...	...	.0078	.0210
550125	...	...	.0072	.0197
560118	...	...	.0065	.0183
570111	...	...	.0059	.0170
580105	...	...	.0053	.0158
590098	...	...	.0047	.0145
600091	...	...	.0042	.0133
610082	...	...	.0037	.0119
620073	...	...	.0032	.0105
630062	...	...	.0027	.0089
640051	...	...	.0023	.0074
650041	...	...	.0020	.0061
660031	...	...	.0016	.0047
670023	...	...	.0013	.0036
6800150011	.0026
6900090008	.0017
7000030006	.0009
710004	.0004
720003	.0003
730001	.0001
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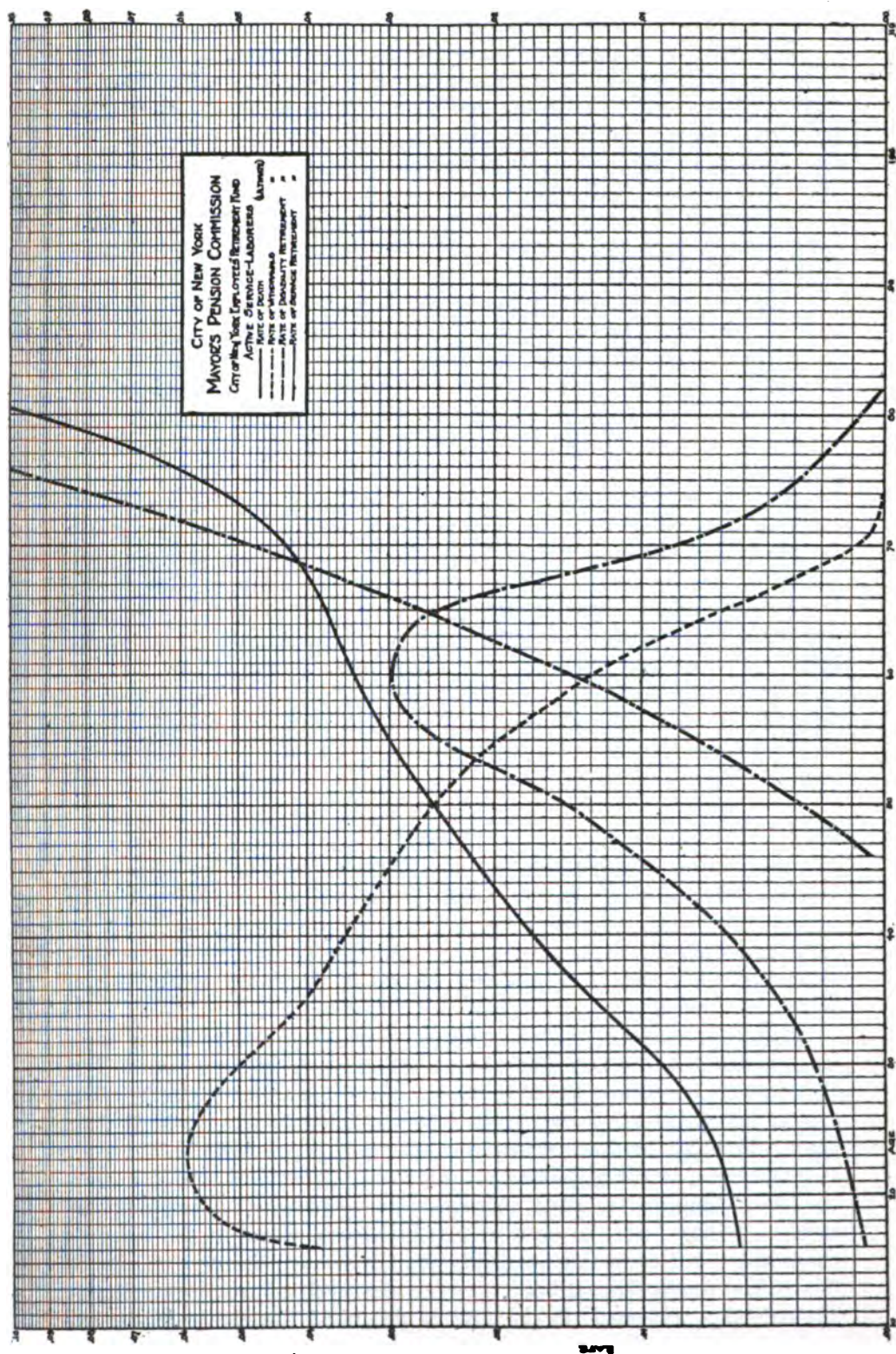
TABLE 105—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund, Laborers

AGE	RATES OF DEATH				RATES OF DISABILITY			
	${}_xq_x^{(a)}$	${}_xq_{[x-1]+1}^{(a)}$	${}_xq_{[x-2]+2}^{(a)}$	${}_xq_x^{(a)}$	${}_xq_{[x-1]+1}^{(a)}$	${}_xq_{[x-2]+2}^{(a)}$	${}_xq_x^{(a)}$	WITH PENSION ${}_xq_x^{(a)}$
54	...	...	...	.0293	...	...	.0232	.0062
55	.0302	...	...	.0302	...	...	.0254	.0073
56	.0309	...	...	.0309	...	...	.0269	.0086
57	.0317	...	...	.0317	...	...	.0283	.0098
58	.0325	...	...	.0325	...	...	.0292	.0111
59	.0332	...	...	.0332	...	...	.0297	.0127
60	.0340	...	...	.0340	...	...	.0299	.0145
61	.0347	...	...	.0347	...	...	.0298	.0165
62	.0354	...	...	.0354	...	...	.0293	.0187
63	.0361	...	...	.0361	...	...	.0284	.0211
64	.0368	...	...	.0368	...	...	.0272	.0240
65	.0374	...	...	.0374	...	...	.0255	.0269
66	.0382	...	...	.0382	...	...	.0227	.0304
67	.0392	...	...	.0392	...	...	.0189	.0343
68	.0401	...	...	.0401	...	...	.0147	.0386
69	.0414	...	...	.0414	...	...	.0109	.0436
70	.0428	...	...	.0428	...	...	.0085	.0490
71	.0446	...	...	.0446	...	...	.0067	.0555
72	.0467	...	...	.0467	...	...	.0054	.0625
73	.0493	...	...	.0493	...	...	.0044	.0710
74	.0529	...	...	.0529	...	...	.0037	.0810
75	.0567	...	...	.0567	...	...	.0030	.0925
76	.0619	...	...	.0619	...	...	.0025	.1065
77	.0675	...	...	.0675	...	...	.0020	.1225
78	.0748	...	...	.0748	...	...	.0016	.1400
79	.0838	...	...	.0838	...	...	.0012	.1590
80	.0950	...	...	.0950	...	...	.0008	.1780
81	.1088	...	...	.1088	...	...	.0005	.1985
82	.1230	...	...	.1230	...	...	.0001	.2215
83	.1495	...	...	.1495	...	...	...	.2550
84	.1620	...	...	.1620	...	...	...	.2900
85	.1930	...	...	.1930	...	...	...	.3380
86	.2330	...	...	.2330	...	...	...	.4000
87	.2730	...	...	.2730	...	...	...	.4725
88	.3110	...	...	.3110	...	...	...	.5650
89	.3560	...	...	.3560	...	...	...	.6750
90	.4060	...	...	.4060	...	...	...	.8000



SECTION II





RATES OF RESIGNATION AND DISMISSAL

The rates of resignation and dismissal for laborers in the City of New York Employees' Retirement Fund vary materially with years of service where such service is less than three completed years. The rate of resignation during the first year of service is exceeded by the rate for the members of the Health Department and for clerks. In the ultimate years it is exceeded by the same two classes.

Considered as an aggregate rate it ranks fourth among the seven rates, lying between that for mechanics, which is higher, and that for street cleaners, which is lower.

The rate of dismissal is the second highest among such rates, not only for the first year of service but for the ultimate years. It is exceeded by the similar rate for the Street Cleaning Department. The aggregate rate for the Street Cleaning Department is also the highest rate of dismissal of all such rates prepared; consequently the aggregate rate for the division of laborers being next to it ranks second among all departments.

The two aggregate rates for laborers combined give a total rate which ranks third out of eleven such rates prepared; being exceeded by the rate for members of the Health Department and by that of clerks and being followed by the rate for members of the College of the City of New York.

No withdrawal rates for outside services were available to compare with those for laborers. The rate, however, in the ultimate years, follows quite closely an aggregate rate covering the public service of New Zealand exclusive of the employees in the Government Railways' Superannuation and the Teachers' Superannuation Funds. The New Zealand rate is generally lower than that for laborers but the two rates agree very closely between the ages of 42 and 52.

RATE OF DEATH

The rate of death among laborers is the highest, being followed by that of clerks. In age groups 30 to 60 the rate for laborers generally exceeds other rates derived from experience of mixed lives, including the rates upon which standard insurance tables are based; which rates are generally higher than those ordinarily found in the active service branch of pension funds.

The explanation of the comparatively high death rate among laborers may lie partly in the fact that laborers are not granted a pension on disability unless they have served thirty years, and consequently deaths occur among the active employees which in a more liberal fund would occur among disability pensioners; and partly in the fact that the laborers are as a whole the lowest paid class and presumably have therefore, as a class, the lowest standard of living. Many of the deaths may too be caused by accident arising from the more or less hazardous nature of the laborer's employment, but as to this possibility the Commission has no data, for in this service deaths from accident were not distinguished from other deaths. No reduction was made in the rate as developed directly from the experience as the basis was considered sufficiently broad to be reliable.

RATE OF DISABILITY WITHOUT PENSION

A rate of separation on account of disability for laborers among members of the City of New York Employees' Retirement Fund was derived, as has been stated, on the assumption that a certain number of withdrawals recorded as resignations actually occurred because of disability. Roughly 37% of total ultimate withdrawals were assumed to have occurred on account of disability. The rate of disability among members of the Street Cleaning Department was used to indicate the trend of the corresponding rate among laborers. This rate of separation on account of disability for laborers was used only as part of the withdrawal rate, and it is of significance solely as a possible division of the rate of withdrawal.

Taken as a whole the rate ranks fourth out of ten rates of disability prepared, being exceeded by the rates for the Police, Street Cleaning and Fire Departments.

RATE OF SERVICE RETIREMENT

A comparatively low rate of retirement was adopted for laborers. The actual experience in regard to their retirement, limited to the two years—1913 and 1914—seemed to indicate even a lower rate than the one adopted. The experience of the laborers who participated in the fund of the Street Cleaning Department seems to indicate that a high rate of retirement, as compared with the rates for the other groups of employees considered under the various city pension funds, is not to be expected among laborers. Among the twelve retirement rates prepared, the one adopted for laborers up to age 65 ranks next to the lowest, which is that for street cleaners.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

The active service—mechanics

The following table shows the rates that were used for mechanics and skilled workmen among the members of the City of New York Employees' Retirement Fund. As has been stated, these rates were based on the experience for men, but used for both men and women. To visualize the increases and decreases in these rates from age to age and to show their relative importance at various ages, diagrams showing the rates plotted on cross section paper are given on pages 206 to 208.

TABLE 106—RATES OF SEPARATION FROM ACTIVE SERVICE
City of New York Employees' Retirement Fund—Mechanics

AGE	RATES OF WITHDRAWAL							
	Resignation				Dismissal			
	$r_w q_{[x]}$	$r_w q_{[x-1]+1}$	$r_w q_{[x-2]+2}$	$r_w q_x^{(a)}$	$d_w q_{[x]}^{(a)}$	$d_w q_{[x-1]+1}^{(a)}$	$d_w q_{[x-2]+2}^{(a)}$	Total Ultimate $w q_x^{(a)}$
16	.0790	...	...	...	.0155	...	...	...
17	.0913	.0579	...	...	.0156	.0148	...	...
18	.0999	.0663	.0473	...	.0157	.0149	.0136	...
19	.1068	.0731	.0535	.0286	.0159	.0150	.0137	.0404
20	.1120	.0785	.0589	.0333	.0160	.0152	.0138	.0448
21	.1158	.0825	.0631	.0402	.0162	.0154	.0139	.0514
22	.1190	.0859	.0668	.0525	.0167	.0157	.0140	.0634
23	.1219	.0885	.0696	.0584	.0171	.0160	.0141	.0690
24	.1240	.0909	.0715	.0599	.0178	.0163	.0143	.0703
25	.1257	.0925	.0724	.0600	.0185	.0168	.0145	.0702
26	.1267	.0935	.0724	.0585	.0198	.0172	.0147	.0685
27	.1270	.0940	.0710	.0551	.0208	.0178	.0148	.0649
28	.1262	.0935	.0688	.0492	.0222	.0184	.0149	.0589
29	.1248	.0919	.0657	.0427	.0240	.0193	.0151	.0522
30	.1213	.0889	.0620	.0363	.0259	.0202	.0152	.0457
31	.1171	.0855	.0577	.0324	.0286	.0212	.0153	.0417
32	.1125	.0819	.0536	.0299	.0305	.0223	.0154	.0391
33	.1074	.0775	.0491	.0280	.0335	.0234	.0155	.0371
34	.1021	.0729	.0453	.0266	.0369	.0247	.0156	.0356
35	.0963	.0683	.0420	.0255	.0407	.0258	.0157	.0344
36	.0913	.0639	.0390	.0245	.0450	.0267	.0157	.0333
37	.0862	.0595	.0365	.0237	.0490	.0276	.0156	.0324
38	.0812	.0552	.0341	.0229	.0528	.0283	.0155	.0316
39	.0762	.0517	.0323	.0223	.0553	.0290	.0154	.0309
40	.0722	.0482	.0308	.0217	.0571	.0292	.0153	.0303
41	...	.0452	.0291	.0212	.0571	.0294	.0152	.0297
42	...	...	.0279	.0205	...	...	.0151	.0289
43	...	...	...	.0198	...	...	...	.0282
44	...	...	...	.0192	...	...	...	.0274
45	...	...	...	.0183	...	...	...	.0264
46	...	...	...	.0172	...	...	...	.0251
47	...	...	...	.0157	...	...	...	.0232
48	...	...	...	.0131	...	...	...	.0202
49	...	...	...	.0111	...	...	...	.0175
50	...	...	...	.0077	...	...	...	.0130
51	...	...	...	.0046	...	...	...	.0078
52	...	...	...	.0032	...	...	...	.0053

TABLE 106--RATES OF SEPARATION FROM ACTIVE SERVICE--Continued

RATES OF WITHDRAWAL							
Age	Resignation			Dismissal			Total Ultimate $w q_z^{(a)}$
	$r_w q_z^{(a)}$	$r_w q_{[x-1]+1}^{(a)}$	$r_w q_{[x-2]+2}^{(a)}$	$d_w q_z^{(a)}$	$d_w q_{[x-1]+1}^{(a)}$	$d_w q_{[x-2]+2}^{(a)}$	
530037
540025
550018
560013
570009
580007
590005
600004
610003
620002
630001
640001
65
66
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TABLE 105—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund, Laborers

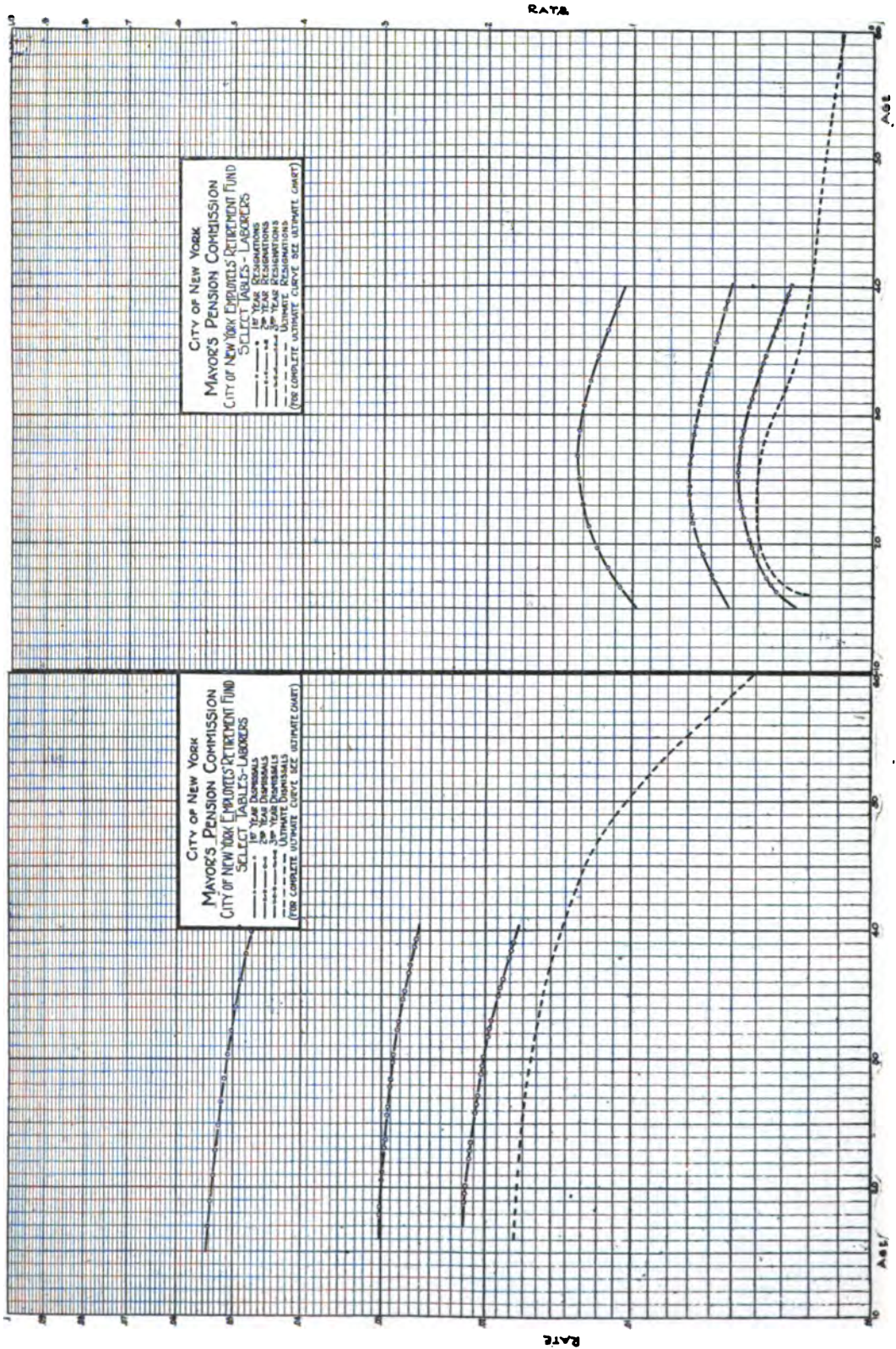
AGE	RATES OF WITHDRAWAL						TOTAL ULTIMATE	
	RESIGNATION			DISMISSAL				
	${}^r w q_{[x]}^{(a)}$	${}^r w q_{[x-1]+1}^{(a)}$	${}^r w q_{[x-2]+2}^{(a)}$	${}^d w q_{[x]}^{(a)}$	${}^d w q_{[x-1]+1}^{(a)}$	${}^d w q_{[x-2]+2}^{(a)}$		
540078	.0210
550072	.0197
560065	.0183
570059	.0170
580053	.0158
590047	.0145
600042	.0133
610037	.0119
620032	.0105
630027	.0089
640023	.0074
650020	.0061
660016	.0047
670013	.0036
680011	.0026
690008	.0017
700006	.0009
710004	.0004
720003	.0003
730001	.0001
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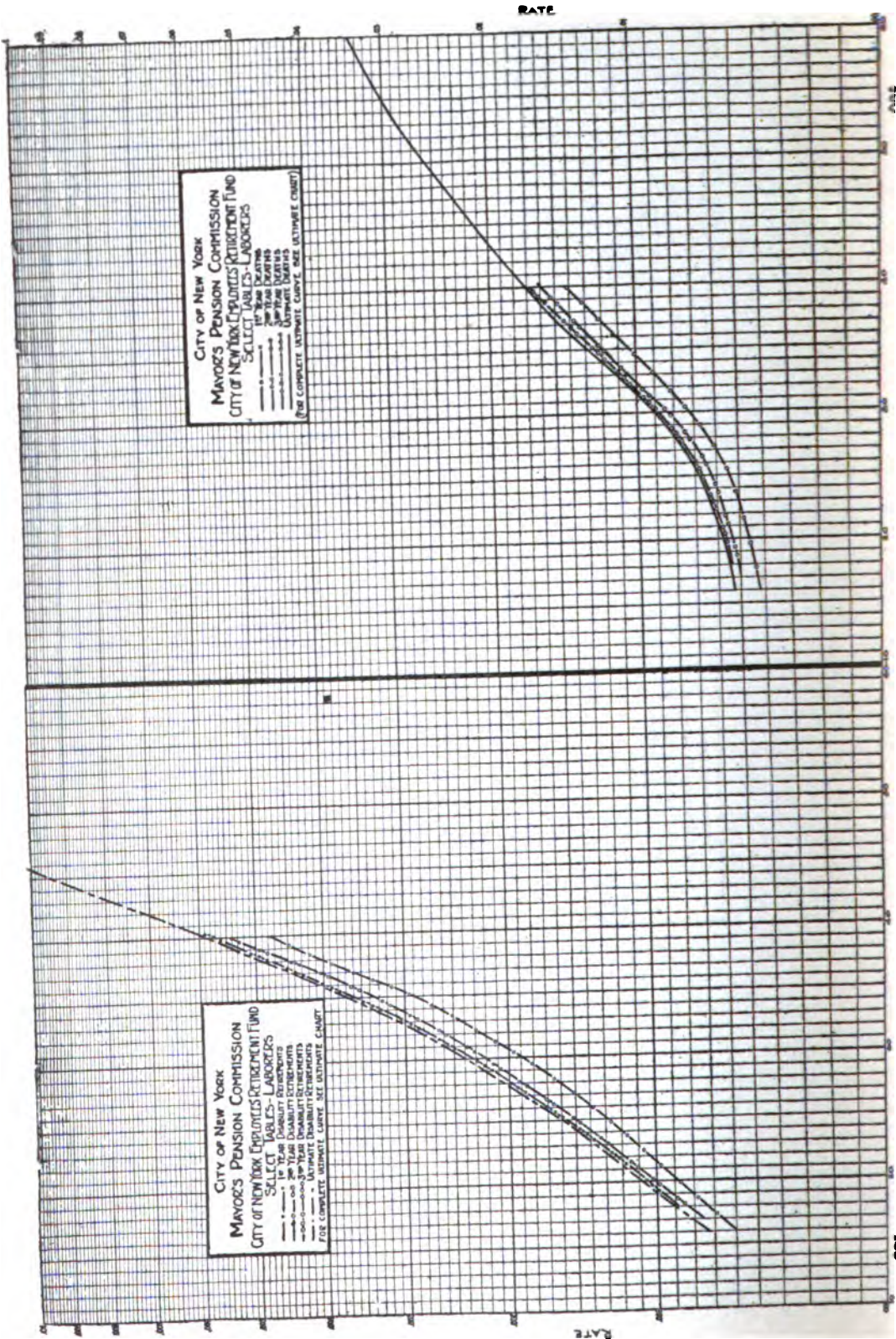
TABLE 105—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund, Laborers

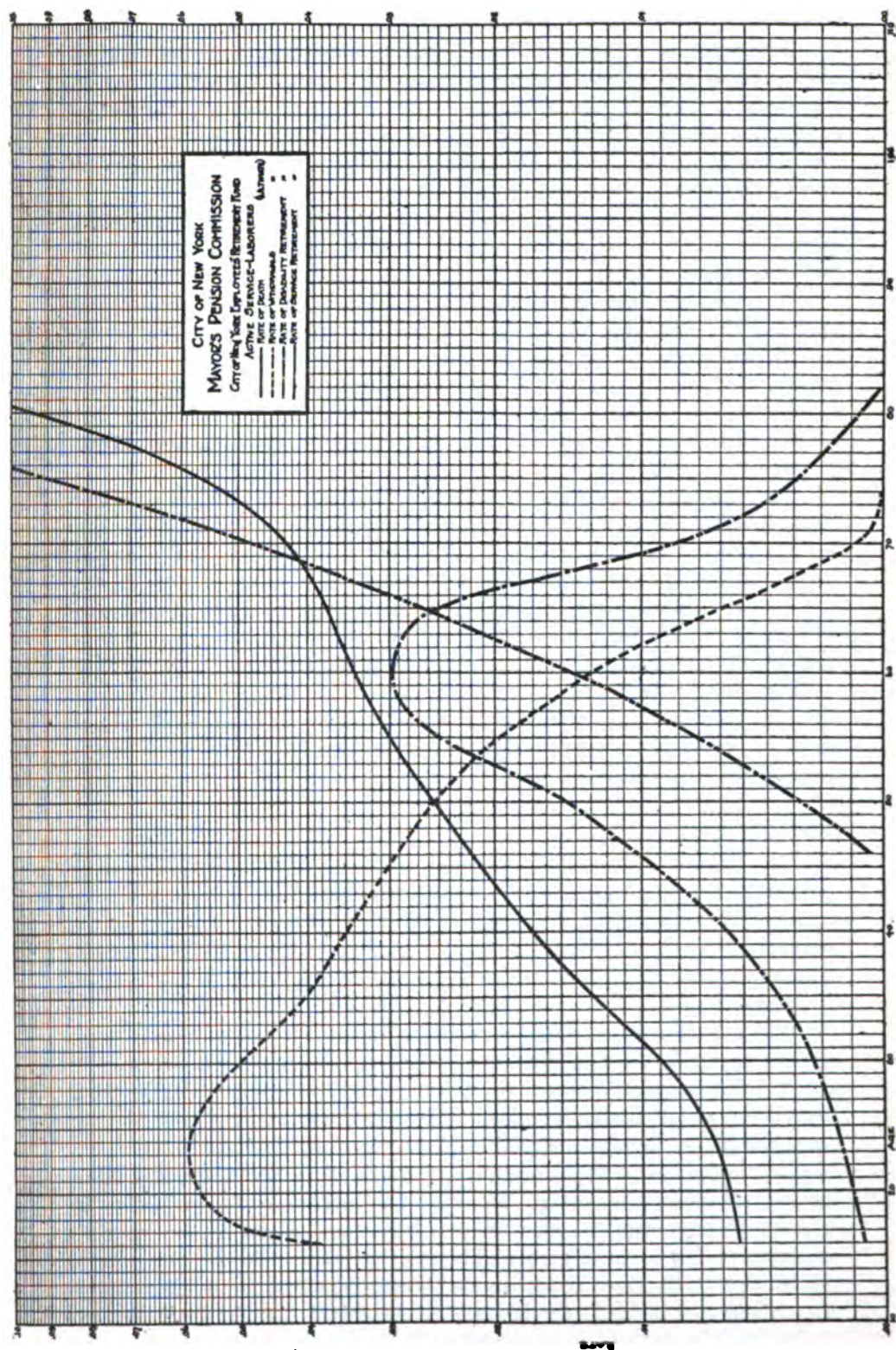
Age	RATES OF DEATH				RATES OF DISABILITY				WITH PENSION ${}_0tq_x^{(a)}$
					WITHOUT PENSION				
	${}_tq_{[x]}^{(a)}$	${}_tq_{[x-1]+1}^{(a)}$	${}_tq_{[x-2]+2}^{(a)}$	${}_tq_x^{(a)}$	${}_tq_{[x]}^{(a)}$	${}_tq_{[x-1]+1}^{(a)}$	${}_tq_{[x-2]+2}^{(a)}$	${}_tq_x^{(a)}$	
16	.0044	...	...	...	.0006	...	...	...	...
17	.0045	.0051	...	...	.0007	.0008	...	...	...
18	.0046	.0052	.0054	...	.0007	.0008	.0009	...	...
19	.0047	.0053	.0055	.0056	.0008	.0009	.0010	.0010	...
20	.0047	.0054	.0057	.0057	.0009	.0010	.0011	.0011	...
21	.0049	.0056	.0058	.0059	.0010	.0011	.0011	.0012	...
22	.0050	.0057	.0060	.0061	.0010	.0012	.0012	.0013	...
23	.0051	.0059	.0062	.0063	.0011	.0013	.0013	.0014	...
24	.0053	.0061	.0064	.0065	.0012	.0014	.0015	.0015	...
25	.0055	.0064	.0067	.0068	.0013	.0015	.0016	.0016	...
26	.0058	.0067	.0070	.0071	.0014	.0016	.0017	.0017	...
27	.0061	.0070	.0074	.0075	.0015	.0018	.0019	.0019	...
28	.0064	.0074	.0078	.0079	.0016	.0019	.0020	.0020	...
29	.0068	.0079	.0083	.0084	.0018	.0021	.0022	.0022	...
30	.0073	.0085	.0089	.0091	.0019	.0022	.0023	.0024	...
31	.0079	.0091	.0096	.0097	.0021	.0024	.0025	.0026	...
32	.0085	.0098	.0103	.0105	.0022	.0026	.0027	.0028	...
33	.0092	.0106	.0108	.0114	.0024	.0028	.0030	.0030	...
34	.0098	.0114	.0120	.0122	.0027	.0031	.0033	.0033	...
35	.0105	.0122	.0128	.0130	.0029	.0034	.0036	.0036	...
36	.0112	.0129	.0136	.0138	.0032	.0037	.0039	.0040	...
37	.0119	.0137	.0144	.0146	.0036	.0041	.0043	.0044	...
38	.0127	.0145	.0152	.0155	.0040	.0045	.0048	.0048	...
39	.0134	.0153	.0160	.0163	.0044	.0050	.0052	.0053	...
40	.0142	.0161	.0168	.0171	.0048	.0055	.0057	.0058	...
41	...	.0169	.0177	.0179	...	.0061	.0063	.0064	...
42	...	...	.0185	.0187	...	...	.0070	.0071	...
43	...	...	...	.0196	...	...	...	.0078	...
44	...	...	...	.0204	...	...	...	.0086	...
45	...	...	...	.0212	...	...	...	.0094	...
46	...	...	...	.0221	...	...	...	.0104	.0003
47	...	...	...	.0229	...	...	...	.0114	.0009
48	...	...	...	.0239	...	...	...	.0124	...
49	...	...	...	.0248	...	...	...	.0135	.0022
50	...	...	...	.0257	...	...	...	.0149	.0020
51	...	...	...	.0266	...	...	...	.0165	.0036
52	...	...	...	.0275	...	...	...	.0184	.0045
53	...	...	...	.0284	...	...	...	.0207	.0053

TABLE 105—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
City of New York Employees' Retirement Fund, Laborers

AGE	RATES OF DEATH				RATES OF DISABILITY			
	WITHOUT PENSION				WITH PENSION			
	${}_tq_{[x]}^{(a)}$	${}_tq_{[x-1]+1}^{(a)}$	${}_tq_{[x-2]+2}^{(a)}$	${}_tq_x^{(a)}$	${}_tq_{[x]}^{(a)}$	${}_tq_{[x-1]+1}^{(a)}$	${}_tq_{[x-2]+2}^{(a)}$	${}_tq_x^{(a)}$
54	...	...	...	.0293	...	...	...	.0232
55	.0302	...	...	.0302	...	...	...	.0254
56	.0309	...	...	.0309	...	...	...	.0269
57	.0317	...	...	.0317	...	...	...	.0283
58	.0325	...	...	.0325	...	...	...	.0292
59	.0332	...	...	.0332	...	...	...	.0297
60	.0340	...	...	.0340	...	...	...	.0299
61	.0347	...	...	.0347	...	...	...	.0298
62	.0354	...	...	.0354	...	...	...	.0293
63	.0361	...	...	.0361	...	...	...	.0284
64	.0368	...	...	.0368	...	...	...	.0272
65	.0374	...	...	.0374	...	...	...	.0255
66	.0382	...	...	.0382	...	...	...	.0227
67	.0392	...	...	.0392	...	...	...	.0189
68	.0401	...	...	.0401	...	...	...	.0147
69	.0414	...	...	.0414	...	...	...	.0109
70	.0428	...	...	.0428	...	...	...	.0085
71	.0446	...	...	.0446	...	...	...	.0067
72	.0467	...	...	.0467	...	...	...	.0054
73	.0493	...	...	.0493	...	...	...	.0044
74	.0529	...	...	.0529	...	...	...	.0037
75	.0567	...	...	.0567	...	...	...	.0030
76	.0619	...	...	.0619	...	...	...	.0025
77	.0675	...	...	.0675	...	...	...	.0020
78	.0748	...	...	.0748	...	...	...	.0016
79	.0838	...	...	.0838	...	...	...	.0012
80	.0930	...	...	.0930	...	...	...	.0008
81	.1088	...	...	.1088	...	...	...	.0005
82	.1230	...	...	.1230	...	...	...	.0001
83	.1495	...	...	.1495	...	...	...	...
84	.1620	...	...	.1620	...	...	...	...
85	.1930	...	...	.1930	...	...	...	...
86	.2330	...	...	.2330	...	...	...	...
87	.2730	...	...	.2730	...	...	...	...
88	.3110	...	...	.3110	...	...	...	...
89	.3500	...	...	.3500	...	...	...	...
90	.4000	...	...	.4000	...	...	...	...







RATE OF RETIREMENT

The rate of retirement as adopted for the mechanics of the City of New York Employees' Retirement Fund fell between the rate for the men teachers and that for the clerks of the same fund. The rate of retirement for mechanics followed more closely the rate for the clerks than that for laborers, as such a course was indicated by the experience of the years 1913 and 1914. The rate taken as a whole up to age 65 is very low, the only lower rates being those for clerks, the members of the College of the City of New York, for laborers and for street cleaners.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

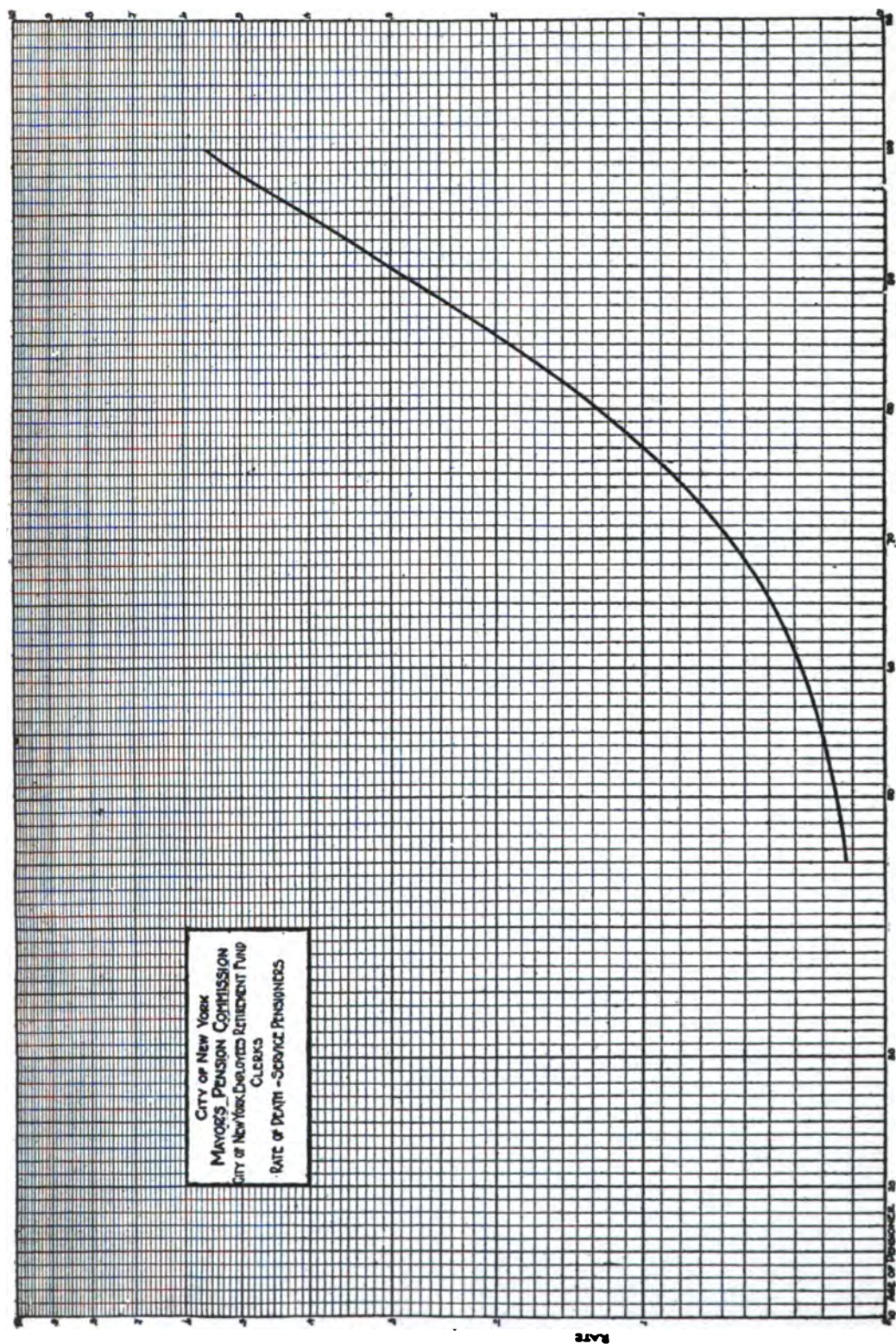
Pensioners—all classes

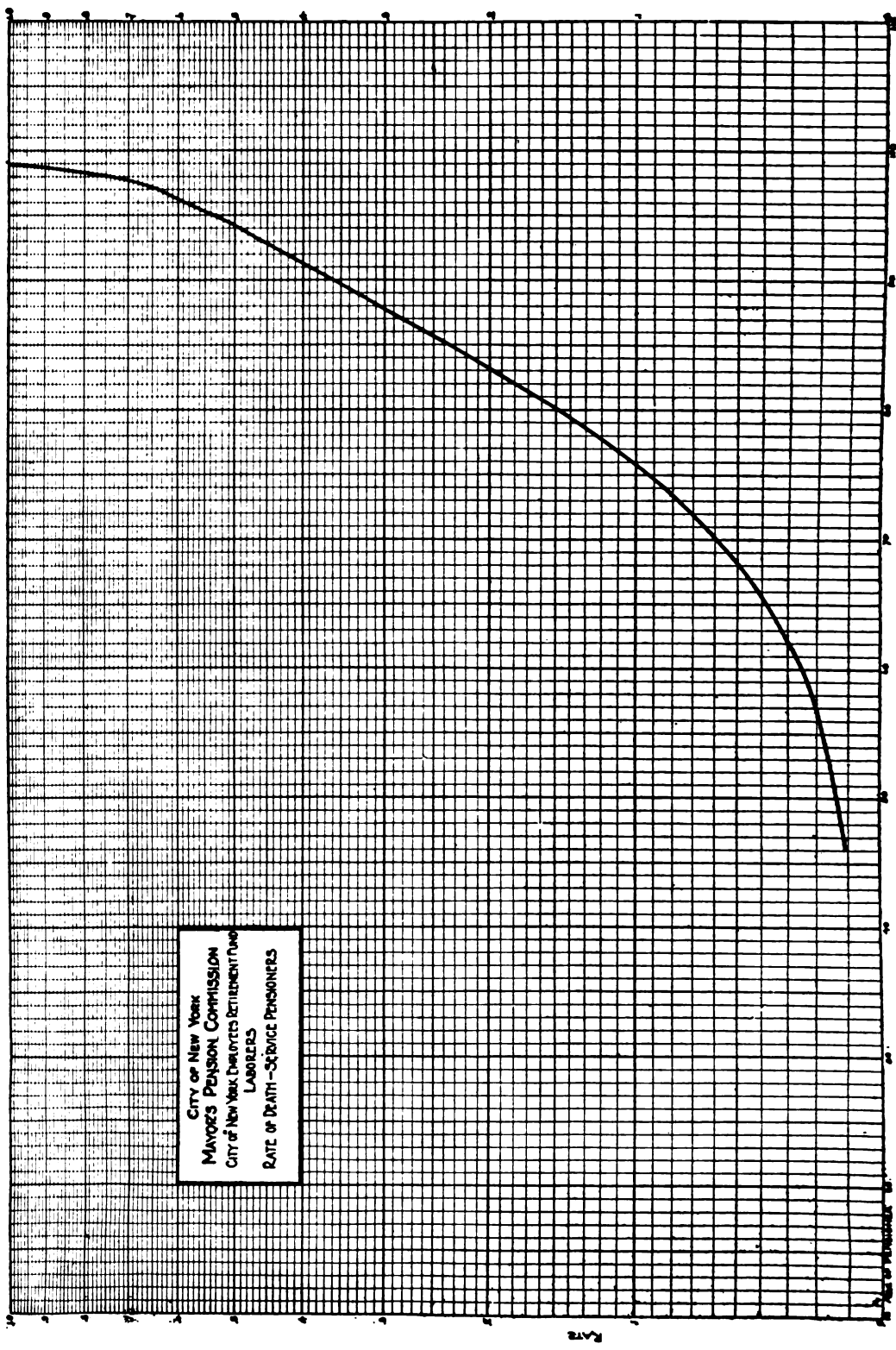
The following table shows the rates used in the construction of mortality tables for pensioners of each of the three divisions—clerks, laborers, and mechanics—of the City of New York Employees' Retirement Fund. Diagrams showing the rates of mortality plotted on cross section paper are given on pages 211 to 213.

TABLE 107—RATES OF MORTALITY AMONG PENSIONERS

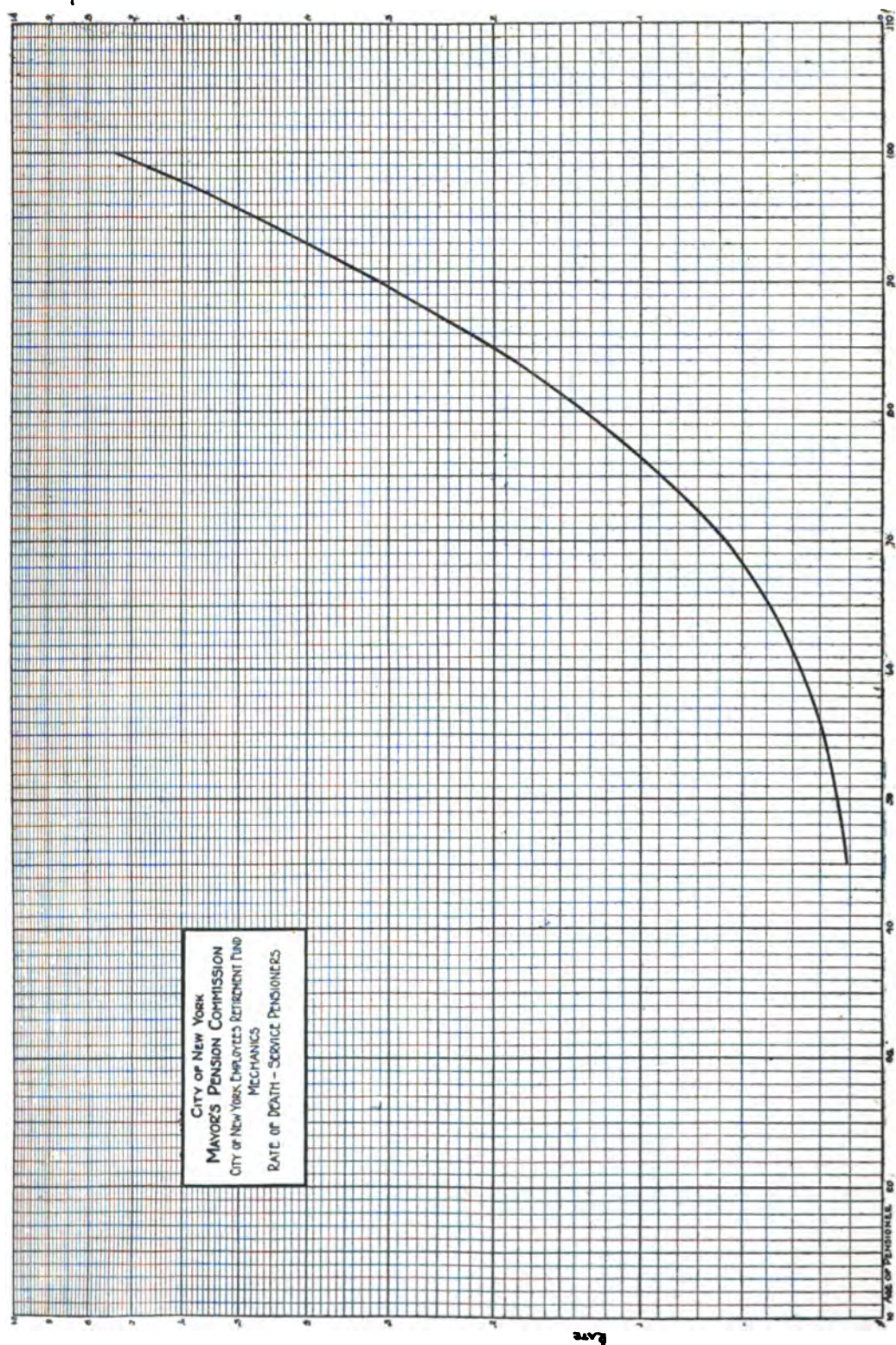
City of New York Employees' Retirement Fund

Age	Laborers	Mechanics	Clerks	Age	Laborers	Mechanics	Clerks
45	.0112	.0113	.0125	73	.0802	.0756	.0726
46	.0116	.0118	.0129	74	.0870	.0823	.0786
47	.0120	.0124	.0135	75	.0944	.0893	.0852
48	.0125	.0132	.0141	76	.1023	.0976	.0924
49	.0131	.0138	.0147	77	.1111	.1060	.1002
50	.0138	.0145	.0154	78	.1208	.1146	.1087
51	.0145	.0153	.0162	79	.1317	.1238	.1179
52	.0154	.0162	.0170	80	.1445	.1338	.1279
53	.0163	.0172	.0180	81	.1586	.1456	.1387
54	.0174	.0180	.0190	82	.1743	.1585	.1505
55	.0186	.0194	.0201	83	.1916	.1723	.1631
56	.0199	.0206	.0213	84	.2114	.1883	.1768
57	.0213	.0220	.0227	85	.2356	.2060	.1915
58	.0229	.0237	.0241	86	.2657	.2250	.2074
59	.0247	.0253	.0258	87	.3030	.2440	.2244
60	.0267	.0272	.0275	88	.3467	.2640	.2426
61	.0289	.0293	.0294	89	.3959	.2890	.2621
62	.0313	.0314	.0315	90	.4545	.3160	.2830
63	.0339	.0338	.0338	91	.5325	.3440	.3051
64	.0369	.0366	.0364	92	.6343	.3730	.3286
65	.0401	.0397	.0391	93	.7342	.4040	.3535
66	.0437	.0428	.0421	94	.8571	.4390	.3797
67	.0476	.0462	.0454	95	1.0000	.4770	.4072
68	.0520	.0498	.0490	96	...	.5200	.4359
69	.0568	.0540	.0529	97	...	.5670	.4659
70	.0620	.0583	.0572	98	...	.6220	.4969
71	.0677	.0638	.0619	99	...	.6780	.5288
72	.0737	.0696	.0670	100	...	.7400	.5615





CITY OF NEW YORK
MAYOR'S PENSION COMMISSION
CITY OF NEW YORK EMPLOYEES RETIREMENT FUND
LABORERS
RATE OF DEATH-SERVICE PENSIONERS



PENSIONERS' DEATH RATE—CLERKS

McClintock's rate of mortality for male annuitants was assumed to reflect the mortality among pensioned clerks.

PENSIONERS' DEATH RATE—LABORERS

The American Experience rate of mortality was assumed to reflect the rate of mortality among pensioned laborers.

PENSIONERS' DEATH RATE—MECHANICS

The rate of death for pensioners among mechanics was an adopted rate which fell between the assumed rate for pensioners among laborers and that assumed for pensioners among clerks.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above, with the exception of the salary scales shown in connection with the active service tables. The salary scales were developed directly from the tabulation of employees' salaries.

City of New York Employees' Retirement Fund—Clerks

Age	LIVING				WITHDRAWALS			
	$l^{(0)}_{[x]}$	$l^{(0)}_{[x-1]+1}$	$l^{(0)}_{[x-2]+2}$	$l^{(0)}_{\frac{x}{2}}$	RESIGNATIONS			
					$r^{(0)}_{[x]}$	$r^{(0)}_{[x-1]+1}$	$r^{(0)}_{[x-2]+2}$	$r^{(0)}_{\frac{x}{2}}$
16	1,000,000	...	...	...	74,900	...	...	...
17	958,069	906,835	...	...	84,310	64,566	...	...
18	912,497	855,708	828,845	...	92,162	69,141	52,217	...
19	864,492	802,538	773,627	765,698	96,823	70,222	52,375	45,712
20	816,027	750,365	710,960	710,813	99,665	69,859	51,117	43,146
21	769,816	700,164	668,743	658,902	100,076	67,986	48,885	40,193
22	723,617	652,917	620,929	610,340	99,136	65,945	46,508	37,109
23	678,624	608,003	576,171	565,266	96,704	63,111	43,674	33,916
24	635,608	565,770	534,602	523,764	93,625	59,858	40,683	30,954
25	594,636	526,043	496,029	485,161	90,087	56,234	37,698	28,308
26	555,535	488,875	460,283	450,343	85,997	52,407	34,751	25,850
27	518,222	454,100	427,327	417,882	81,416	48,041	31,904	23,610
28	483,041	421,780	396,749	387,045	76,804	45,088	29,320	21,531
29	449,929	391,606	368,242	360,366	72,214	41,432	26,514	19,604
30	418,633	363,519	342,045	334,971	67,400	37,842	23,977	17,820
31	389,252	337,484	317,804	311,597	62,631	34,457	21,585	16,203
32	361,697	313,400	295,593	290,072	57,944	31,246	19,267	14,707
33	336,166	291,058	274,981	270,200	53,450	28,116	17,269	13,350
34	312,119	270,520	256,035	251,999	49,003	25,185	15,311	12,046
35	289,996	251,455	238,717	235,441	44,688	22,354	13,583	10,821
36	269,758	234,182	222,189	219,889	40,700	19,882	11,984	9,763
37	250,936	218,414	208,222	205,761	36,938	17,648	10,598	8,745
38	233,995	203,980	194,959	192,866	33,401	15,503	9,358	7,789
39	217,614	191,005	182,856	180,939	29,378	13,752	8,265	6,876
40	204,196	179,213	171,846	170,117	26,995	12,133	7,372	6,124
41	...	168,620	161,873	160,155	...	10,707	6,507	5,237
42	...	...	152,887	151,174	...	...	5,825	4,535
43	...	...	...	143,973	...	...	...	3,889
44	...	...	...	135,486	...	...	...	3,374
45	...	...	...	128,571	...	...	...	2,932
46	...	...	...	122,133	...	...	...	2,553
47	...	...	...	116,024	...	...	...	2,239
48	...	...	...	110,121	...	...	...	1,949
49	...	...	...	104,385	...	...	...	1,701
50	...	...	...	98,769	...	...	...	1,482
51	...	...	...	93,191	...	...	...	1,267
52	...	...	...	87,773	...	...	...	1,088
53	...	...	...	82,565	...	...	...	925

TABLE 108—SELECT ACTIVE SERVICE AND SALARY SCALE—Continued
City of New York Employees' Retirement Fund—Clerks

Age	LIVING				WITHDRAWALS			
	RESIGNATIONS							
	$I^{(a)}_{[z]}$	$I^{(a)}_{[z-1]+1}$	$I^{(a)}_{[z-2]+2}$	$I^{(a)}_{[z]}$	$r^{(a)}_{[z]}$	$r^{(a)}_{[z-1]+1}$	$r^{(a)}_{[z-2]+2}$	$r^{(a)}_{[z]}$
54	77,581	...	...	...	791
55	72,838	...	...	...	670
56	68,310	...	...	...	567
57	64,013	...	...	...	486
58	59,911	...	...	...	401
59	56,002	...	...	...	330
60	52,290	...	...	...	272
61	48,734	...	...	...	205
62	45,355	...	...	...	172
63	42,112	...	...	...	131
64	39,018	...	...	...	98
65	36,062	...	...	...	69
66	33,241	...	...	...	43
67	30,550	...	...	...	24
68	27,984	...	...	...	8
69	25,524	...	...	...	...
70	23,155	...	...	...	...
71	20,855	...	...	...	...
72	18,595	...	...	...	...
73	16,337	...	...	...	...
74	14,008	...	...	...	...
75	11,473	...	...	...	...
76	8,846	...	...	...	...
77	6,293	...	...	...	...
78	3,992	...	...	...	...
79	2,167	...	...	...	...
80	964	...	...	...	...
81	326	...	...	...	...
82	74	...	...	...	...
83	9	...	...	...	...

TABLE 108—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
City of New York Employees' Retirement Fund—Clerks

CLERKS, LABORERS AND MECHANICS

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AGE	WITHDRAWALS					Deaths	SEPARATIONS BY DISABILITY		SALARY SCALE
	DISMISSALS						Without Pension	With Pension	
	Total Ultimate								
	$d_w^{(a)}$	$d_w^{(a)}[x-1]+1$	$d_w^{(a)}[x-2]+2$	$d_w^{(a)}[x-3]+3$	$w_x^{(a)}$				
16	13,800	...	...	...	...	$d_x^{(a)}$	$t_x^{(a)}$	$o_x^{(a)}$	$s_x^{(a)}$
17	13,605	8,978	...	...	...	$d_x^{(a)}[x-1]+1$	$t_x^{(a)}[x-1]+1$	$o_x^{(a)}$	$s_x^{(a)}[x-1]+1$
18	13,414	8,557	6,547	...	...	$d_x^{(a)}[x-2]+2$	$t_x^{(a)}[x-2]+2$	...	$s_x^{(a)}[x-2]+2$
19	13,054	8,106	5,832	4,923	50,635	$d_x^{(a)}[x-3]+3$	$t_x^{(a)}[x-3]+3$	...	$s_x^{(a)}[x-3]+3$
20	12,989	7,654	5,189	4,656	47,802	...	...	...	...
21	12,856	7,282	5,551	4,402	44,595	...	...	...	...
22	12,663	6,986	5,340	4,150	41,259	...	...	...	...
23	12,487	6,627	5,070	3,923	37,839	...	...	...	...
24	12,394	6,337	4,812	3,703	34,657	...	...	...	...
25	12,250	6,102	4,564	3,486	31,794	...	...	...	...
26	12,055	5,818	4,327	3,288	29,138	...	...	...	...
27	11,816	5,540	4,188	3,097	26,707	...	...	...	...
28	11,496	5,315	3,928	2,913	24,444	...	...	...	...
29	11,158	5,091	3,719	2,753	22,357	...	...	...	...
30	10,801	4,835	3,523	2,606	20,426	...	...	...	...
31	10,354	4,657	3,370	2,455	18,658	...	...	...	...
32	9,910	4,388	3,191	2,320	17,027	...	...	...	...
33	9,480	4,191	2,997	2,195	15,545	...	...	...	...
34	9,020	3,977	2,842	2,071	14,117	...	...	...	...
35	8,555	3,772	2,674	1,960	12,781	...	...	...	...
36	8,066	3,560	2,495	1,847	11,610	...	...	...	...
37	7,553	3,342	2,353	1,745	10,490	...	...	...	...
38	7,090	3,182	2,223	1,639	9,428	...	...	...	...
39	6,615	2,999	2,066	1,538	8,414	...	...	...	...
40	6,187	2,813	1,925	1,444	7,568	...	...	...	...
41	...	2,631	1,797	1,349	6,586	...	...	...	...
42	...	...	1,682	1,259	5,794	...	...	...	...
43	...	...	...	1,170	5,059	...	...	...	...
44	...	...	...	1,084	4,458	...	...	...	...
45	...	...	...	998	3,930	...	...	...	...
46	...	...	...	911	3,404	...	...	73	1,609
47	...	...	...	825	3,064	...	...	197	1,615
48	...	...	...	741	2,690	...	...	319	1,618
49	...	...	...	661	2,362	...	...	408	1,618
50	...	...	...	583	2,065	...	...	503	1,615
51	...	...	...	509	1,776	...	...	597	1,612
52	...	...	...	439	1,527	...	...	676	1,611
53	...	...	...	375	1,300	...	...	743	1,610

TABLE 108—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
City of New York Employees' Retirement Fund—Clerks

AGE	WITHDRAWALS					Deaths	SEPARATIONS BY DISABILITY		SALARY SCALE
	DISMISSALS				Without Pension		With Pension		
	$d_{w[s]}$	$d_{w[s-1]+1}$	$d_{w[s-1]+s}$	$d_{w[s]}$				Total Ultimate	
54	318	1,109	573	800	1,610	
55	268	938	567	860	1,610	
56	224	791	552	901	1,610	
57	186	666	530	954	1,609	
58	153	554	503	1,007	1,609	
59	125	455	473	1,031	1,605	
60	102	374	439	1,083	1,600	
61	80	285	404	1,121	1,599	
62	63	235	368	1,157	1,598	
63	49	180	328	1,192	1,596	
64	38	136	288	1,225	1,593	
65	27	96	247	1,255	1,591	
66	19	62	202	1,284	1,590	
67	13	37	158	1,308	1,589	
68	8	16	120	1,338	1,589	
69	4	4	88	1,366	1,588	
70	1	1	65	1,398	1,586	
71	47	1,452	1,582	
72	34	1,534	1,581	
73	24	1,683	1,580	
74	16	1,961	1,579	
75	11	2,123	1,577	
76	7	2,105	1,576	
77	4	1,904	1,574	
78	2	1,507	1,572	
79	1	901	1,571	
80	525	1,570	
81	209	1,569	
82	54	1,566	
83	7	1,563	

AGE	LIVING					WITHELDRAWS			
	RESIGNATIONS								
	$l_{[x]}^{(0)}$	$l_{[x-1]+1}^{(0)}$	$l_{[x-1]+2}^{(0)}$	$l_{[x]}^{(0)}$	$l_{[x]}^{(0)}$	$r_{[x]}^{(0)}$	$r_{[x-1]+1}^{(0)}$	$r_{[x-1]+2}^{(0)}$	$r_{[x]}^{(0)}$
16	1,000,000	...	...	...	104,000	...	...	...	...
17	950,148	830,402	...	...	104,516	50,100	...	...	...
18	899,770	789,135	...	...	103,474	40,321	30,170	...	...
19	848,435	742,841	736,139	704,631	101,303	48,210	30,155	...	26,706
20	798,090	696,679	711,204	660,908	98,165	46,329	28,977	30,155	26,172
21	749,188	652,494	624,886	618,676	94,398	44,230	28,807	28,977	25,242
22	702,674	610,279	584,325	578,289	90,575	42,048	27,697	28,807	24,057
23	658,059	570,425	545,761	539,960	86,140	39,701	26,251	27,697	22,679
24	615,561	532,856	509,605	503,820	81,316	37,300	24,818	26,251	21,110
25	576,123	497,071	475,719	470,024	76,024	34,837	23,263	24,818	19,506
26	538,921	465,217	444,183	438,546	72,162	32,565	21,632	23,263	17,805
27	504,386	434,702	415,102	409,396	67,537	30,256	20,133	21,632	16,130
28	472,370	406,738	387,921	382,503	62,967	28,065	18,388	20,133	14,535
29	442,697	381,089	363,030	357,744	58,569	25,914	16,809	18,388	12,915
30	415,065	357,527	340,321	335,059	54,290	23,954	15,349	16,809	11,426
31	389,851	335,736	319,447	314,269	50,369	22,158	14,056	15,349	10,119
32	365,913	315,767	300,070	295,130	46,617	20,525	12,663	14,056	8,913
33	343,671	296,932	282,321	277,514	42,993	18,944	11,547	12,663	7,853
34	323,017	279,469	265,023	261,221	39,731	17,383	10,359	11,547	6,948
35	303,255	263,126	250,102	246,096	36,633	16,025	9,382	10,359	6,226
36	284,753	247,518	235,667	231,938	33,601	14,628	8,460	9,382	5,590
37	267,172	233,047	221,934	218,652	30,725	13,470	7,546	8,460	5,051
38	250,649	219,286	209,088	206,132	28,073	12,280	6,816	7,546	4,597
39	235,113	206,314	196,926	194,285	25,627	11,203	6,124	6,816	4,158
40	220,299	194,084	185,436	183,090	23,352	10,267	5,526	6,124	3,808
41	...	182,385	174,546	172,460	...	9,302	4,974	5,526	3,466
42	...	...	164,187	162,361	...	...	4,450	4,974	3,163
43	...	...	...	152,765	...	...	...	4,450	2,884
44	...	...	...	143,639	...	...	...	...	2,646
45	...	...	...	134,946	...	...	...	...	2,416
46	...	...	...	126,668	...	...	...	...	2,208
47	...	...	...	118,739	...	...	...	...	2,013
48	...	...	...	111,130	...	...	...	...	1,828
49	...	...	...	103,811	...	...	...	...	1,661
50	...	...	...	96,806	...	...	...	...	1,499
51	...	...	...	90,089	...	...	...	...	1,349
52	...	...	...	83,649	...	...	...	...	1,207
53	...	...	...	77,461	...	...	...	...	1,071

TABLE 109—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
City of New York Employees' Retirement Fund—Laborers

AGE	LIVING				WITHDRAWALS			
	RESIGNATIONS							
	$l_x^{(a)}$	$l_{[x-1]+1}^{(a)}$	$l_{[x-2]+2}^{(a)}$	$l_x^{(a)}$	$r_{wp}^{(a)}[x]$	$r_{wp}^{(a)}[x-1]+1$	$r_{wp}^{(a)}[x-2]+2$	$r_{wp}^{(a)}[x]$
54	71,519	...	...	...	942
55	65,820	...	...	...	821
56	60,389	...	...	...	713
57	55,274	...	...	...	616
58	50,477	...	...	...	530
59	46,008	...	...	...	451
60	41,863	...	...	...	380
61	38,028	...	...	...	313
62	34,494	...	...	...	251
63	31,255	...	...	...	194
64	28,300	...	...	...	143
65	25,602	...	...	...	105
66	23,148	...	...	...	73
67	20,925	...	...	...	48
68	18,917	...	...	...	29
69	17,101	...	...	...	15
70	15,432	...	...	...	4
71	13,870	...	...	...	...
72	12,383	...	...	...	...
73	10,961	...	...	...	...
74	9,592	...	...	...	...
75	8,272	...	...	...	...
76	7,013	...	...	...	...
77	5,815	...	...	...	...
78	4,608	...	...	...	...
79	3,481	...	...	...	...
80	2,783	...	...	...	...
81	2,021	...	...	...	...
82	1,399	...	...	...	...
83	917	...	...	...	...
84	546	...	...	...	...
85	299	...	...	...	...
86	140	...	...	...	...
87	52	...	...	...	...
88	13	...	...	...	...
89	2	...	...	...	...

AGE	WITHDRAWALS					DEATHS	SEPARATIONS BY DISABILITY		SALARY SCALE	
	DISMISSALS				TOTAL ULTIMATE		WITHOUT PENSION	WITH PENSION		
	$e_{wp}^{(0)}[z]$	$e_{wp}^{(0)}[z-1]+1$	$e_{wp}^{(0)}[z-2]+2$	$e_{wp}^{(0)}[z]$						$w_z^{(0)}$
16	54,600	...	...	...	...	4,393	605	...	$s_z^{(2)}$ 250
17	51,593	25,259	...	...	...	4,262	642	...	$s_z^{(2-1)+1}$ 360
18	48,677	23,832	16,560	...	...	4,112	666	...	$s_z^{(2-2)+2}$ 447
19	45,816	22,360	15,504	12,380	39,086	3,946	691	...	515	
20	42,937	20,970	14,487	11,566	37,738	3,787	707	...	575	
21	40,156	19,575	13,435	10,790	36,032	3,638	717	...	619	
22	37,452	18,248	12,446	10,050	34,107	3,499	723	...	658	
23	34,943	16,999	11,570	9,341	32,020	3,386	734	...	689	
24	32,563	15,826	10,752	8,675	29,785	3,270	741	...	715	
25	30,362	14,731	9,990	8,052	27,558	3,177	743	...	738	
26	28,185	13,678	9,283	7,473	25,278	3,113	759	...	754	
27	26,270	12,693	8,634	6,931	23,061	3,062	770	...	770	
28	24,516	11,830	7,991	6,426	20,961	3,022	776	...	782	
29	22,799	11,052	7,369	5,968	18,883	3,019	783	...	795	
30	21,210	10,297	6,874	5,535	16,961	3,032	797	...	803	
31	19,843	9,636	6,389	5,148	15,267	3,061	811	...	810	
32	18,442	8,999	5,971	4,781	13,694	3,099	823	...	815	
33	17,218	8,374	5,562	4,449	12,302	3,150	841	...	818	
34	16,119	7,853	5,127	4,136	11,084	3,176	865	...	820	
35	15,011	7,341	4,779	3,859	10,065	3,199	894	...	821	
36	13,981	6,832	4,431	3,572	9,162	3,201	923	...	820	
37	13,011	6,339	4,106	3,319	8,370	3,192	958	...	820	
38	12,081	5,899	3,806	3,069	7,666	3,185	996	...	820	
39	11,215	5,488	3,525	2,850	7,008	3,157	1,030	...	819	
40	10,376	5,085	3,264	2,636	6,444	3,124	1,062	...	817	
41	...	4,705	3,020	2,442	5,908	3,087	1,104	...	814	
42	...	...	2,791	2,267	5,415	3,036	1,145	...	813
43	...	...	...	2,067	4,951	2,986	1,189	...	811
44	...	...	...	1,893	4,539	2,923	1,231	...	810
45	...	...	...	1,727	4,143	2,861	1,274	...	808
46	...	...	...	1,569	3,777	2,799	1,315	38	802
47	...	...	...	1,421	3,434	2,719	1,349	107	800
48	...	...	...	1,276	3,104	2,650	1,376	189	798
49	...	...	...	1,140	2,801	2,575	1,401	228	794
50	...	...	...	1,009	2,508	2,488	1,440	281	792
51	...	...	...	886	2,235	2,396	1,485	324	790
52	...	...	...	770	1,977	2,300	1,535	376	789
53	...	...	...	661	1,732	2,196	1,603	411	787

TABLE 109—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
City of New York Employees' Retirement Fund—Laborers

AGE	WITHDRAWALS					DEATHS	SEPARATIONS BY DISABILITY		SALARY SCALE
	DISMISSALS			TOTAL ULTIMATE			WITHOUT PENSION	WITH PENSION	
	$d_{w[s]}$	$d_{w[s-1]+1}$	$d_{w[s-2]+2}$	$d_{w[s]}$	$w_{\frac{s}{2}}$				
54	563	1,505	2,092	1,659	443	786
55	473	1,294	1,085	1,672	480	784
56	393	1,106	1,866	1,624	519	783
57	325	941	1,749	1,505	542	782
58	267	797	1,638	1,474	560	781
59	216	667	1,527	1,367	584	780
60	175	555	1,421	1,252	607	780
61	141	454	1,320	1,133	627	780
62	112	363	1,221	1,010	645	780
63	86	280	1,128	888	659	779
64	66	209	1,040	770	679	777
65	50	155	957	653	689	775
66	37	110	884	525	704	773
67	28	76	819	395	718	771
68	21	50	759	277	730	770
69	14	29	708	186	746	769
70	10	14	660	132	756	768
71	5	5	619	93	770	765
72	3	3	578	67	774	762
73	2	2	541	48	778	760
74	508	35	777	758
75	469	25	765	755
76	434	17	747	752
77	393	12	712	750
78	351	8	688	747
79	309	4	585	741
80	265	2	495	736
81	220	1	401	728
82	172	...	310	719
83	137	...	234	708
84	89	...	158	694
85	58	...	101	679
86	32	...	56	660
87	14	...	25	640
88	4	...	7	610
89	1	...	1	503

TABLE 110—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE

City of New York Employees' Retirement Fund—Mechanics

Age	LIVING					WITHDRAWALS			
	$l_{[s]}^{(0)}$	$l_{[s-1]+1}^{(0)}$	$l_{[s-2]+2}^{(0)}$	$l_{\frac{1}{2}}^{(0)}$	$r_{w[s]}^{(0)}$	Resignations			$r_{w \frac{1}{2}}^{(0)}$
						$r_{w[s-1]+1}^{(0)}$	$r_{w[s-2]+2}^{(0)}$	$r_{w \frac{1}{2}}^{(0)}$	
16	1,000,000	...	...	...	70,000	...	...	...	...
17	984,138	901,783	...	...	80,852	52,213	...	...	...
18	957,813	875,265	832,555	...	95,085	58,030	39,380	...	...
19	921,617	843,452	800,556	778,214	98,428	61,656	42,830	...	22,257
20	872,005	804,978	765,587	743,202	97,665	63,190	45,093	...	24,749
21	817,495	756,880	726,044	706,421	94,666	62,443	45,813	...	28,398
22	763,602	706,160	679,355	666,713	90,860	60,659	45,381	...	35,003
23	711,916	656,654	631,087	621,136	86,782	58,114	43,924	...	36,274
24	663,318	609,761	584,835	575,066	82,251	55,427	41,816	...	34,447
25	618,502	566,201	541,336	531,597	77,746	52,374	39,193	...	31,896
26	579,536	526,380	501,381	491,360	73,427	49,216	36,300	...	28,745
27	545,004	491,809	465,285	454,886	69,216	46,230	33,035	...	25,064
28	514,661	461,727	434,100	422,639	64,950	43,172	29,866	...	20,794
29	486,738	433,623	407,398	395,104	60,745	40,034	26,766	...	16,871
30	460,342	411,699	384,570	371,868	55,839	36,000	23,843	...	13,499
31	435,658	389,973	364,176	352,274	51,016	33,343	21,013	...	11,414
32	412,720	369,820	345,739	334,967	46,431	30,288	18,532	...	10,016
33	391,497	351,048	328,632	319,230	42,047	27,206	16,136	...	8,939
34	371,669	333,628	312,920	304,695	37,947	24,321	14,176	...	8,105
35	353,070	317,250	298,309	291,106	34,001	21,668	12,529	...	7,424
36	336,015	301,867	284,565	278,265	30,678	19,289	11,098	...	6,817
37	319,780	287,305	271,607	266,088	27,565	17,094	9,914	...	6,306
38	304,614	273,550	259,285	254,460	24,734	15,100	8,842	...	5,827
39	289,424	260,704	247,617	243,332	22,054	13,478	7,908	...	5,426
40	275,358	248,199	236,499	232,640	19,881	11,963	7,284	...	5,048
41	...	236,525	225,759	222,367	...	10,691	6,569	...	4,714
42	...	...	215,600	212,478	...	...	6,015	...	4,356
43	...	...	...	202,989	...	...	...	...	4,030
44	...	...	...	193,852	...	...	...	...	3,718
45	...	...	...	185,088	...	...	...	...	3,379
46	...	...	...	176,256	...	...	...	...	3,026
47	...	...	...	167,745	...	...	...	...	2,627
48	...	...	...	159,621	...	...	...	...	2,097
49	...	...	...	151,998	...	...	...	...	1,684
50	...	...	...	144,805	...	...	...	...	1,115
51	...	...	...	138,229	...	...	...	...	633
52	...	...	...	132,291	...	...	...	...	419
53	...	...	...	126,551	...	...	...	...	287

TABLE 110—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

City of New York Employees' Retirement Fund—Mechanics

AGE	WITHDRAWALS				Deaths	SEPARATIONS BY DISABILITY		Salary Scale
	Dismissals			Total Ultimate		Without Pension	With Pension	
	$d_{w[s]}^{(a)}$	$d_{w[s-1]+1}^{(a)}$	$d_{w[s-2]+2}^{(a)}$					
16	15,500	...	...	...	$d_{w[s]}^{(a)}$	$d_{w[s-1]+1}^{(a)}$	$d_{w[s-2]+2}^{(a)}$	$s[s]$
17	15,352	13,346	...	...	2,759	958	...	$s[s-1]+1$
18	15,038	13,041	11,323	...	2,705	904	...	$s[s-2]+2$
19	14,654	12,652	10,967	...	2,663	975	...	s
20	13,952	12,236	10,565	9,198	2,576	981	...	
21	13,243	11,656	10,092	8,524	2,527	981	...	
22	12,752	11,087	9,511	7,884	2,458	968	...	
23	12,174	10,506	8,898	7,247	2,367	960	...	
24	11,807	9,939	8,363	6,597	2,267	932	...	
25	11,442	9,512	7,849	5,963	2,162	897	...	
26	11,475	9,054	7,370	5,407	2,073	861	...	
27	11,336	8,754	6,886	4,904	1,990	835	...	
28	11,426	8,495	6,468	4,458	1,924	801	...	
29	11,682	8,407	6,152	4,079	1,893	769	...	
30	11,923	8,316	5,846	3,753	1,861	751	...	
31	12,198	8,267	5,572	3,488	1,867	740	...	
32	12,588	8,247	5,324	3,269	1,895	729	...	
33	13,115	8,215	5,094	3,068	1,936	717	...	
34	13,715	8,241	4,881	2,899	1,995	712	...	
35	14,370	8,185	4,683	2,727	2,050	707	...	
36	15,121	8,060	4,468	2,585	2,125	707	...	
37	15,669	7,930	4,237	2,449	2,207	704	...	
38	16,084	7,741	4,019	2,326	2,288	708	...	
39	16,005	7,561	3,813	2,200	2,380	712	...	
40	15,723	7,248	3,619	1,996	2,454	712	...	
41	...	6,954	3,432	1,895	2,513	716	...	
42	...	...	3,256	1,793	2,562	718	...	
43	...	...	...	1,699	2,613	727	...	
44	...	...	...	1,601	2,669	739	...	
45	...	...	...	1,501	2,695	750	...	
46	...	...	...	1,391	2,730	759	463	
47	...	...	...	1,267	2,758	772	564	
48	...	...	...	1,132	2,810	783	637	
49	...	...	...	976	2,865	795	734	
50	...	...	...	767	2,918	809	806	
51	...	...	...	442	2,984	827	883	
52	...	...	...	276	3,069	854	940	
53	...	...	...	177	3,142	884	1,019	
				464	3,177	924	1,101	

TABLE—PENSIONERS' MORTALITY TABLE

City of New York Employees' Retirement Fund—Clerks

Table employed was same as that used for pensioners of Supreme Court, First Department, Pension Fund. See Table 155, page 287.

TABLE 111—PENSIONERS' MORTALITY *TABLE

City of New York Employees' Retirement Fund—Laborers

Age	Living $l_z^{(p)}$	Dying $d_z^{(p)}$	Age	Living $l_z^{(p)}$	Dying $d_z^{(p)}$
20	92,637	723	61	56,371	1,628
21	91,914	722	62	54,743	1,713
22	91,192	721	63	53,030	1,800
23	90,471	720	64	51,230	1,889
24	89,751	719	65	49,341	1,980
25	89,032	718	66	47,361	2,070
26	88,314	718	67	45,291	2,158
27	87,596	718	68	43,133	2,243
28	86,878	718	69	40,890	2,321
29	86,160	719	70	38,569	2,391
30	85,441	720	71	36,178	2,448
31	84,721	721	72	33,730	2,487
32	84,000	723	73	31,243	2,505
33	83,277	726	74	28,738	2,501
34	82,551	729	75	26,237	2,476
35	81,822	732	76	23,761	2,431
36	81,090	737	77	21,330	2,399
37	80,353	742	78	18,961	2,291
38	79,611	749	79	16,670	2,196
39	78,862	756	80	14,474	2,091
40	78,106	765	81	12,383	1,964
41	77,341	774	82	10,419	1,816
42	76,567	785	83	8,603	1,648
43	75,782	797	84	6,955	1,470
44	74,985	812	85	5,485	1,292
45	74,173	828	86	4,193	1,114
46	73,345	848	87	3,079	933
47	72,497	870	88	2,146	744
48	71,627	896	89	1,402	555
49	70,731	927	90	847	385
50	69,804	962	91	462	246
51	68,842	1,001	92	216	137
52	67,841	1,044	93	79	58
53	66,797	1,091	94	21	18
54	65,706	1,143	95	3	3
55	64,563	1,199	96	...	...
56	63,364	1,260	97	...	...
57	62,104	1,325	98	...	...
58	60,779	1,394	99	...	...
59	59,385	1,468	100	...	...
60	57,917	1,546	..	...	...

*American Experience Table

TABLE 112—PENSIONERS' MORTALITY TABLE

City of New York Employees' Retirement Fund—Mechanics

Age	Living $l_x^{(p)}$	Dying $d_x^{(p)}$	Age	Living $l_x^{(p)}$	Dying $d_x^{(p)}$
45	100,000	1,130	74	39,344	3,238
46	98,870	1,167	75	36,106	3,224
47	97,703	1,212	76	32,882	3,209
48	96,491	1,274	77	29,673	3,145
49	95,217	1,314	78	26,528	3,040
50	93,903	1,362	79	23,488	2,908
51	92,541	1,416	80	20,580	2,754
52	91,125	1,476	81	17,826	2,595
53	89,649	1,542	82	15,231	2,414
54	88,107	1,586	83	12,817	2,208
55	86,521	1,679	84	10,600	1,998
56	84,842	1,748	85	8,611	1,774
57	83,094	1,828	86	6,837	1,538
58	81,266	1,926	87	5,299	1,293
59	79,340	2,007	88	4,006	1,058
60	77,333	2,103	89	2,948	852
61	75,230	2,204	90	2,096	662
62	73,026	2,293	91	1,434	493
63	70,733	2,391	92	941	351
64	68,342	2,501	93	590	238
65	65,841	2,614	94	352	155
66	63,227	2,706	95	197	94
67	60,521	2,796	96	103	54
68	57,725	2,875	97	49	28
69	54,850	2,962	98	21	12
70	51,888	3,025	99	9	6
71	48,863	3,117	100	3	2
72	45,746	3,184	101	1	1
73	42,562	3,218	..	...	...

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table, based on an assumed entrance salary of \$1,000, shows for each of the three divisions of the City of New York Employees' Retirement Fund the present value of the total salary to be earned during active service and the present value of the pension that may be paid as described in the enumeration of benefits on page 179. Due allowances have been made, of course, for increases in salary and for the fact that the benefit is based on final salary.

TABLE 113—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUE OF THE PENSION BENEFIT, PAYABLE TO THESE MEMBERS, BASED ON AN ENTRANCE SALARY OF \$1,000.

City of New York Employees' Retirement Fund

AGE AT ENTRANCE	CLERKS		MECHANICS		LABORERS	
	Future Salary	Pension Upon Service Retirement	Future Salary	Pension Upon Service Retirement	Future Salary	Pension Upon Service Retirement
20	\$15,456	\$98	\$13,807	\$106	\$10,160	\$26
25	9,491	81	11,111	111	8,542	32
30	8,697	101	10,093	126	8,005	42
35	8,757	120	9,651	142	7,748	53
40	8,970	154	9,535	153	7,666	63

The following table shows the expectations of life of pensioners of each of the three divisions of the City of New York Employees' Retirement Fund, together with the annuity values based on the mortality tables, which were used in valuing pensions:

TABLE 114—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO PENSIONERS
City of New York Employees' Retirement Fund

AGE	CLERKS			LABORERS			MECHANICS			AGE	CLERKS			LABORERS			MECHANICS		
	Annuity Value	Expectation of Life		Annuity Value	Expectation of Life		Annuity Value	Expectation of Life			Annuity Value	Expectation of Life		Annuity Value	Expectation of Life		Annuity Value	Expectation of Life	
45	14.65	24.56		14.75	24.54		14.73	24.63		73	6.34	7.81		5.88	7.11		6.14	7.52	
46	14.40	23.87		14.48	23.81		14.45	24.18		74	6.04	7.38		5.59	6.68		5.85	7.09	
47	14.15	23.17		14.21	23.08		14.20	23.19		75	5.76	6.97		5.29	6.27		5.56	6.68	
48	13.89	22.48		13.94	22.36		13.93	22.47		76	5.48	6.57		5.01	5.88		5.28	6.29	
49	13.62	21.80		13.65	21.63		13.65	21.77		77	5.20	6.19		4.72	5.49		5.01	5.91	
50	13.35	21.11		13.36	20.91		13.37	21.06		78	4.94	5.82		4.44	5.11		4.75	5.55	
51	13.07	20.44		13.06	20.20		13.08	20.37		79	4.68	5.47		4.16	4.74		4.49	5.21	
52	12.79	19.76		12.75	19.49		12.79	19.67		80	4.43	5.13		3.88	4.39		4.24	4.87	
53	12.50	19.10		12.44	18.79		12.49	18.99		81	4.18	4.81		3.61	4.05		3.99	4.55	
54	12.21	18.44		12.13	18.09		12.19	18.31		82	3.95	4.50		3.34	3.71		3.74	4.24	
55	11.91	17.79		11.81	17.40		11.88	17.64		83	3.72	4.21		3.08	3.39		3.51	3.94	
56	11.62	17.14		11.48	16.72		11.57	16.98		84	3.50	3.94		2.82	3.08		3.28	3.66	
57	11.31	16.50		11.15	16.05		11.25	16.33		85	3.29	3.68		2.56	2.77		3.06	3.39	
58	11.01	15.88		10.82	15.39		10.93	15.68		86	3.09	3.43		2.30	2.47		2.85	3.14	
59	10.70	15.26		10.49	14.74		10.61	15.05		87	2.90	3.19		2.05	2.18		2.66	2.91	
60	10.38	14.65		10.15	14.10		10.29	14.43		88	2.71	2.97		1.81	1.91		2.47	2.68	
61	10.07	14.05		9.81	13.47		9.97	13.82		89	2.54	2.77		1.58	1.66		2.29	2.47	
62	9.75	13.46		9.47	12.86		9.64	13.22		90	2.37	2.57		1.37	1.42		2.11	2.27	
63	9.44	12.88		9.13	12.26		9.32	12.63		91	2.22	2.39		1.17	1.21		1.95	2.08	
64	9.12	12.31		8.79	11.67		8.99	12.00		92	2.07	2.22		1.00	1.04		1.80	1.91	
65	8.80	11.76		8.45	11.10		8.67	11.50		93	1.93	2.06		0.85	0.89		1.66	1.75	
66	8.49	11.22		8.12	10.54		8.34	10.95		94	1.80	1.91		0.70	0.74		1.51	1.59	
67	8.17	10.69		7.78	10.00		8.02	10.42		95	1.67	1.77		0.56	0.60		1.38	1.44	
68	7.86	10.17		7.45	9.47		7.70	9.90		96	1.56	1.64		0.42	0.46		1.26	1.31	
69	7.55	9.67		7.13	8.97		7.38	9.39		97	1.45	1.52		0.30	0.34		1.16	1.19	
70	7.24	9.18		6.81	8.48		7.07	8.90		98	1.35	1.41		0.18	0.21		1.05	1.10	
71	6.93	8.71		6.49	8.00		6.75	8.42		99	1.25	1.30		0.06	0.09		0.92	0.94	
72	6.63	8.25		6.18	7.55		6.44	7.96		100	1.17	1.21		0.00	0.00		0.83	0.83	

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of clerks, administrative officers and technical employees among members of the City of New York Employees' Retirement Fund in active service as of June 30, 1914, exclusive of clerks among exempt, appointed and elected employees:

TABLE 115—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS, SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

City of New York Employees' Retirement Fund—Clerks

AGE	MEN		WOMEN		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
15	8	\$2,400	1	\$600	12,277	\$15,180,970
16	81	27,240	...	...	12,268	15,177,970
17	94	30,520	...	...	12,187	15,150,730
18	108	38,880	3	1,140	12,093	15,120,210
19	99	47,920	13	6,840	11,982	15,080,190
20	163	95,490	37	23,260	11,870	15,025,430
21	208	135,310	40	24,900	11,670	14,906,680
22	255	196,970	47	32,070	11,422	14,746,470
23	285	245,430	55	39,070	11,120	14,517,430
24	242	235,440	68	50,290	10,780	14,232,930
25	233	246,810	122	97,850	10,470	13,947,200
26	241	264,900	147	114,090	10,115	13,602,540
27	316	362,780	102	85,420	9,727	13,223,550
28	337	408,820	133	109,830	9,309	12,775,350
29	276	343,940	126	106,490	8,839	12,256,700
30	299	387,100	145	127,470	8,437	11,806,270
31	340	460,440	103	95,340	7,993	11,291,700
32	312	420,030	110	101,970	7,550	10,735,920
33	279	393,990	109	98,870	7,128	10,213,920
34	314	422,020	118	112,210	6,740	9,721,060
35	294	417,340	100	97,960	6,308	9,186,830
36	242	340,850	86	82,370	5,914	8,671,530
37	262	385,040	72	68,360	5,586	8,248,310
38	237	348,800	91	87,100	5,252	7,794,910
39	223	331,820	76	69,740	4,924	7,359,010
40	274	421,280	73	66,060	4,625	6,957,450
41	200	305,630	53	49,630	4,278	6,470,110
42	236	377,960	59	52,120	4,025	6,114,850
43	179	278,050	47	43,950	3,730	5,684,770
44	208	342,970	53	48,260	3,504	5,362,770
45	168	283,350	42	37,610	3,243	4,971,540
46	192	304,940	39	34,900	3,033	4,650,580
47	172	282,940	29	25,550	2,802	4,310,740
48	180	293,380	29	26,960	2,601	4,002,250
49	152	231,190	35	32,780	2,392	3,681,910
50	153	250,600	33	25,150	2,205	3,417,940
51	148	242,570	16	13,130	2,019	3,142,190
52	149	235,540	15	14,320	1,855	2,886,490
53	105	103,010	11	10,440	1,691	2,636,630
54	134	218,950	15	12,480	1,575	2,463,180
55	116	189,830	17	14,310	1,426	2,231,750
56	113	188,940	15	12,730	1,293	2,027,610
57	94	150,910	9	7,820	1,165	1,825,940
58	106	175,340	5	3,820	1,062	1,667,210
59	85	128,020	5	4,050	951	1,488,050
60	76	125,340	3	3,150	861	1,355,980

TABLE 115—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS, SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE—Continued

City of New York Employees' Retirement Fund—Clerks

AGE	MEN		WOMEN		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
61	87	\$144,430	..	...	782	\$1,227,490
62	54	83,800	3	\$2,700	695	1,083,060
63	49	79,370	3	2,500	638	996,560
64	63	92,740	3	5,060	586	914,690
65	53	87,100	1	750	520	816,890
66	50	87,570	3	2,200	466	729,040
67	40	62,860	2	1,320	413	639,270
68	58	85,320	2	1,300	371	575,090
69	36	55,750	2	1,260	311	488,470
70	51	80,120	1	720	273	431,460
71	46	80,440	..	...	221	350,620
72	41	64,850	1	600	175	270,180
73	19	28,580	1	600	133	204,730
74	29	45,750	2	2,400	113	175,550
75	25	44,610	..	...	82	127,400
76	12	18,040	..	...	57	82,790
77	15	23,640	..	...	45	64,750
78	11	15,120	..	...	30	41,110
79	5	6,950	1	720	19	25,990
80	4	6,160	..	...	13	18,320
81	1	1,200	..	...	9	12,160
82	2	2,850	..	...	8	10,960
83	2	2,310	..	...	6	8,110
84	..	...	..	...	4	5,800
85	2	2,500	..	...	4	5,800
86	..	...	..	...	2	3,300
87	..	...	..	...	2	3,300
88	..	...	..	...	2	3,300
89	2	3,300	..	...	2	3,300

**TABLE 116—NUMBER AND SALARIES OF ACTIVE MEMBERS,
CLASSIFIED BY LENGTH OF SERVICE, WITH ADDI-
TIONAL COLUMNS SHOWING THE TOTAL NUMBER
AND SALARIES OF EMPLOYEES WHO HAVE HAD THE
INDICATED SERVICE OR MORE**

City of New York Employees' Retirement Fund—Clerks

TOTAL SERVICE — YEARS	MEN		WOMEN		Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
	Number	Salaries	Number	Salaries		
0	1,334	\$1,308,110	455	\$333,540	12,277	\$15,180,970
1	1,213	1,309,240	361	286,920	10,488	13,539,320
2	919	1,025,550	372	301,210	8,914	11,943,160
3	720	826,230	233	190,790	7,623	10,616,400
4	667	869,010	181	156,750	6,670	9,599,380
5	407	516,380	136	124,050	5,822	8,573,620
6	552	780,820	109	97,480	5,279	7,933,190
7	546	778,760	119	117,180	4,618	7,054,890
8	516	751,000	141	140,510	3,953	6,158,950
9	334	473,990	59	50,860	3,296	5,267,440
10	194	312,490	55	50,820	2,903	4,742,590
11	240	353,430	76	78,640	2,654	4,379,280
12	409	663,710	66	76,120	2,338	3,947,210
13	87	146,350	14	15,010	1,863	3,207,380
14	150	250,590	27	31,450	1,762	3,046,020
15	210	344,750	15	16,890	1,585	2,763,980
16	424	783,760	47	50,920	1,360	2,402,340
17	98	163,030	14	14,960	889	1,567,660
18	136	232,010	13	16,140	777	1,389,670
19	135	236,920	5	6,450	628	1,141,520
20	60	103,150	5	4,540	488	898,150
21	44	93,000	3	3,410	423	790,460
22	43	73,630	4	4,650	376	694,050
23	48	84,690	2	2,400	329	615,770
24	46	78,770	2	1,320	279	528,680
25	31	67,830	5	6,000	231	448,590
26	27	56,650	2	2,850	195	374,760
27	30	51,900	3	2,820	166	315,260
28	20	44,000	2	3,300	133	260,540
29	22	45,580	3	1,800	111	213,240
30 and over	83	161,050	3	4,810	86	165,860

The following tables show the number of laborers among members of the City of New York Employees' Retirement Fund in active service as of June 30, 1914, exclusive of laborers among exempt employees:

TABLE 117—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

City of New York Employees' Retirement Fund—Laborers

AGE	MEN		WOMEN		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
16	2	\$600	8	\$1,700	12,015	\$8,896,680
17	4	1,320	22	5,020	12,005	8,894,380
18	3	1,380	37	9,000	11,979	8,888,040
19	8	3,570	31	7,320	11,939	8,877,660
20	14	6,920	35	8,900	11,900	8,866,770
21	10	5,660	21	6,080	11,851	8,850,950
22	31	19,220	23	7,060	11,820	8,839,210
23	38	24,510	15	4,520	11,766	8,812,930
24	63	42,240	20	5,460	11,713	8,783,900
25	82	53,950	19	5,480	11,630	8,736,200
26	155	106,700	17	5,080	11,529	8,676,770
27	112	80,480	15	5,160	11,357	8,564,990
28	192	143,990	18	6,550	11,230	8,479,350
29	175	131,120	15	4,580	11,020	8,328,810
30	217	162,430	16	5,240	10,830	8,193,110
31	206	161,030	14	4,340	10,597	8,025,440
32	235	184,660	22	8,300	10,377	7,860,070
33	211	167,020	16	6,690	10,120	7,667,110
34	289	231,870	15	6,550	9,893	7,493,400
35	241	194,920	18	6,240	9,589	7,254,980
36	286	224,220	29	11,200	9,330	7,053,820
37	248	192,400	12	5,380	9,015	6,818,400
38	321	253,770	30	12,510	8,755	6,620,620
39	282	233,900	26	10,090	8,404	6,354,340
40	299	237,880	34	13,080	8,096	6,110,350
41	304	242,110	25	9,590	7,763	5,859,390
42	328	273,030	33	14,880	7,434	5,607,690
43	237	187,140	31	11,670	7,073	5,319,780
44	289	236,530	43	18,150	6,805	5,120,970
45	310	249,590	41	17,570	6,473	4,866,290
46	307	239,340	33	15,100	6,122	4,599,130
47	295	238,160	40	17,570	5,782	4,344,690
48	315	247,520	33	13,420	5,447	4,088,060
49	259	201,000	40	17,120	5,099	3,828,020
50	317	247,730	46	17,900	4,800	3,609,900
51	260	211,910	20	8,860	4,437	3,344,270
52	264	205,610	28	11,220	4,157	3,123,500
53	259	205,900	29	11,610	3,865	2,906,670
54	286	219,930	28	12,640	3,577	2,689,160
55	300	238,250	29	11,490	3,263	2,456,590
56	238	180,540	22	8,820	2,934	2,206,850
57	187	147,900	11	4,910	2,674	2,017,490
58	259	200,030	18	7,220	2,476	1,864,680
59	207	154,490	12	5,520	2,199	1,657,430
60	192	149,950	21	9,620	1,980	1,497,420
61	151	114,680	10	5,130	1,767	1,337,850
62	176	132,090	10	4,590	1,606	1,218,040
63	102	80,440	4	2,090	1,420	1,081,360
64	151	120,720	6	3,270	1,314	998,830
65	124	99,220	6	3,490	1,157	874,840
66	135	102,680	6	2,200	1,027	772,130
67	112	91,080	4	2,160	886	667,250
68	113	82,910	1	280	770	574,010
69	93	68,650	5	1,840	656	490,820
70	130	105,140	..	...	558	420,330
71	74	56,200	..	...	428	315,190
72	76	56,960	1	360	354	258,990
73	44	31,140	3	1,250	277	201,670
74	65	48,160	2	1,600	230	169,280
75	43	31,240	1	360	163	119,520
76	25	19,410	1	480	119	87,920
77	29	22,640	..	...	93	68,030

TABLE 120—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

City of New York Employees' Retirement Fund—Mechanics

Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	509	\$644,330	6,064	\$9,059,650	16	305	\$459,450	829	\$1,309,640
1	630	773,310	5,555	8,415,320	17	70	109,320	524	850,190
2	461	584,760	4,925	7,642,010	18	62	112,440	454	740,870
3	317	426,830	4,464	7,057,250	19	59	89,500	392	628,430
4	471	658,990	4,147	6,630,420	20	43	65,680	333	538,930
5	288	441,290	3,676	5,971,430	21	26	39,470	290	473,250
6	271	389,450	3,388	5,530,140	22	43	65,360	264	433,780
7	470	730,040	3,117	5,140,690	23	20	34,050	221	368,420
8	446	732,080	2,647	4,410,650	24	29	45,840	201	334,370
9	314	508,000	2,201	3,678,570	25	47	73,630	172	288,530
10	223	375,380	1,887	3,170,570	26	19	26,940	125	214,900
11	219	353,500	1,664	2,795,190	27	13	19,750	106	187,960
12	272	497,700	1,445	2,441,690	28	13	22,340	93	168,210
13	121	241,380	1,173	1,943,990	29	15	29,590	80	145,870
14	138	242,400	1,052	1,702,610	30 & over	65	116,280	65	116,280
15	85	150,570	914	1,460,210					

The following tables show the number of exempt, elected and appointed employees in active service as of June 30, 1914:

TABLE 121—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

City of New York Employees' Retirement Fund—Exempt, Elected and Appointed Employees

AGE	EXEMPT		ELECTED AND APPOINTED		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
15	2	\$540	..	...	2,832	\$7,196,130
16	12	3,390	..	...	2,830	7,195,590
17	12	3,410	..	...	2,818	7,192,200
18	17	6,620	..	...	2,806	7,188,790
19	23	10,170	..	...	2,789	7,182,170
20	42	22,610	..	...	2,766	7,172,000
21	40	23,000	..	...	2,724	7,149,390
22	59	39,680	..	...	2,684	7,126,390
23	67	50,830	1	\$1,500	2,625	7,086,710
24	56	43,160	..	...	2,557	7,034,380
25	65	55,070	..	...	2,501	6,991,220
26	93	88,210	..	...	2,436	6,936,150
27	67	68,650	2	20,500	2,343	6,847,940
28	65	76,930	2	26,500	2,274	6,758,790

TABLE 121—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE—Continued

City of New York Employees' Retirement Fund—Exempt, Elected and Appointed Employees

AGE	EXEMPT		ELECTED AND APPOINTED		Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number	Salaries	Number	Salaries		
29	62	\$75,590	2	\$24,500	2,207	\$6,655,360
30	67	108,520	6	57,500	2,143	6,555,270
31	80	146,220	1	7,000	2,070	6,389,250
32	65	89,790	8	57,000	1,989	6,236,030
33	61	96,910	11	113,500	1,916	6,089,240
34	70	130,590	14	110,500	1,844	5,878,830
35	72	142,700	13	95,000	1,760	5,637,740
36	75	143,140	15	130,500	1,675	5,400,040
37	52	109,270	20	123,300	1,585	5,126,400
38	80	181,830	15	114,500	1,513	4,893,830
39	53	130,030	9	60,200	1,418	4,597,500
40	78	177,300	15	97,600	1,356	4,401,270
41	78	190,660	12	127,000	1,263	4,126,370
42	66	117,940	15	143,000	1,173	3,808,710
43	55	141,970	11	96,900	1,092	3,547,770
44	76	170,680	15	123,300	1,026	3,308,900
45	61	130,440	12	79,800	935	3,014,920
46	72	148,270	19	147,500	862	2,804,680
47	53	121,430	12	102,000	771	2,508,910
48	52	126,090	12	82,500	706	2,285,480
49	41	87,050	11	116,500	642	2,076,890
50	45	92,920	4	32,000	590	1,873,340
51	39	88,200	8	59,500	541	1,747,420
52	40	101,560	5	52,500	494	1,599,720
53	37	122,170	7	64,500	449	1,445,660
54	56	116,460	11	74,800	405	1,258,990
55	37	82,860	6	56,500	338	1,067,730
56	23	68,080	5	46,000	295	928,370
57	33	68,760	7	55,900	267	814,290
58	15	48,120	3	30,500	227	689,630
59	26	58,440	4	23,500	209	611,010
60	16	38,680	1	4,000	179	529,070
61	13	33,210	2	11,000	162	486,390
62	15	30,030	1	9,000	147	442,180
63	11	33,360	..	..	131	403,150
64	15	26,290	4	33,000	120	369,790
65	16	25,380	3	26,000	101	310,500
66	14	36,640	3	21,000	82	259,120
67	9	26,110	..	..	65	201,480
68	4	24,780	2	24,500	56	175,370
69	13	44,240	1	3,000	50	126,090
70	7	21,580	..	..	36	78,850
71	6	8,950	..	..	29	57,270
72	3	4,930	..	..	23	48,320
73	3	4,200	1	4,000	20	43,390
74	6	9,100	1	10,000	16	35,190
75	1	1,800	..	..	9	16,090
76	2	3,750	..	..	8	14,290
77	3	7,300	..	..	6	10,540
78	..	..	..	..	3	3,240
79	1	540	..	..	3	3,240
80	..	..	..	..	2	2,700
81	1	2,250	..	..	2	2,700
82	..	..	..	..	1	450
83	1	450	..	..	1	450

**TABLE 122—NUMBER AND SALARIES OF ACTIVE MEMBERS,
CLASSIFIED BY LENGTH OF SERVICE, WITH ADDI-
TIONAL COLUMNS SHOWING THE TOTAL NUMBER
AND SALARIES OF EMPLOYEES WHO HAVE HAD THE
INDICATED SERVICE OR MORE**

**City of New York Employees' Retirement Fund—Exempt, Elected and Appointed
Employees**

TOTAL SERVICE — YEARS	EXEMPT		ELECTED AND APPOINTED		Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
	Number	Salaries	Number	Salaries		
0	388	\$797,980	99	\$620,400	2,832	\$7,196,130
1	302	361,400	25	193,300	2,345	5,777,750
2	278	439,030	27	177,700	2,018	5,223,050
3	171	275,220	20	171,500	1,713	4,606,320
4	280	613,110	45	348,200	1,522	4,159,600
5	88	105,830	7	72,000	1,188	3,198,290
6	166	302,350	28	270,500	1,093	3,020,460
7	113	208,480	22	272,000	899	2,447,610
8	102	209,450	7	49,300	764	1,967,130
9	89	135,320	8	91,000	655	1,708,380
10	75	144,980	4	25,000	558	1,482,060
11	49	69,950	5	58,000	479	1,312,080
12	62	107,050	6	40,500	425	1,184,130
13	53	79,490	2	29,500	357	1,036,580
14	35	105,990	3	33,500	302	927,590
15	38	50,060	1	7,500	264	788,100
16	47	125,900	9	80,500	225	730,540
17	27	47,090	..	...	169	524,140
18	21	40,430	4	64,500	142	477,050
19	26	55,610	2	12,000	117	372,120
20	11	12,670	1	4,000	89	304,510
21	13	25,860	1	10,000	77	287,840
22	7	13,580	..	...	63	251,980
23	8	19,010	1	17,500	56	238,400
24	9	24,410	1	8,000	47	201,890
25	4	17,880	..	...	37	169,480
26	3	12,550	1	8,000	33	151,600
27	4	10,890	2	22,500	29	131,050
28	3	10,940	..	...	23	97,660
29	5	15,520	..	...	20	86,720
30 & over	14	52,800	1	18,400	15	71,200

**TABLE 123—EXEMPT, ELECTED AND APPOINTED
EMPLOYEES. CLASSIFIED BY OCCUPATION**

City of New York Employees' Retirement Fund

Class	Number	Salaries
Clerks.....	2,478	\$6,898,420
Laborers.....	336	271,760
Mechanics.....	18	25,950
Total.....	2,832	\$7,196,130

The following table shows the number of pensioners, classified as clerks, laborers or mechanics, on the roll as of June 30, 1914:

**TABLE 124—NUMBER AND PENSIONS OF ALL PENSIONERS
CLASSIFIED BY AGE**

City of New York Employees' Retirement Fund

AGE	CLERKS		LABORERS		MECHANICS	
	Number	Pensions	Number	Pensions	Number	Pensions
51	..	...	..	...	1	\$630
52	..	...	..	...	..	...
53	..	...	..	...	..	...
54	..	...	..	...	..	...
55	..	...	..	...	..	...
56	..	...	..	...	..	...
57	..	...	..	...	..	...
58	1	\$1,170	1	\$390	1	740
59	2	2,470	..	...	..	...
60	..	...	1	420	..	...
61	1	1,150	..	...	..	...
62	2	1,850	..	...	1	660
63	1	1,200	..	...	..	...
64	3	3,430	..	...	1	900
65	1	1,350	..	...	..	...
66	..	...	2	1,150	2	1,390
67	..	...	2	910	2	1,460
68	..	...	1	540	1	1,200
69	1	1,250	6	2,800	4	3,040
70	1	590	2	1,500	2	1,520
71	3	2,230	1	600	2	1,560
72	5	4,510	2	900	1	820
73	1	750	4	2,210	3	2,100
74	5	6,150	3	1,420	1	680
75	..	...	2	760	1	690
76	1	1,200	3	1,710	1	520
77	2	1,570	1	450	1	900
78	5	6,460	..	...	..	...
79	1	980	1	280	1	600
80	2	920	..	...	..	...
81	..	...	3	1,800	..	...
82	..	...	..	...	..	...
83	2	2,400	..	...	..	...
84	2	1,980	1	450	..	...
85	..	...	1	660	..	...
86	1	1,500	..	...	..	...
Total Men	41	\$44,470	36	\$18,500	26	\$19,410
Total Women	2	640	1	450	..	...
Grand Total	43	\$45,110	37	\$18,950	26	\$19,410

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets of June 30, 1914, and shows the complete financial condition of the fund

**TABLE 125—A VALUATION OF ASSETS AND LIABILITIES OF
VALUED AS OF**

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 43 Pensioners among Clerks now on the pension roll of the fund as follows:	
41 Men on annual pensions aggregating \$44,470	\$296,586
2 Women on annual pensions aggregating \$640	3,007
Pensions to 37 Pensioners among Laborers now on the pension roll of the fund as follows:	
36 Men on annual pensions aggregating \$18,500	112,291
1 Woman on annual pensions aggregating \$450	2,514
Pensions to 26 Pensioners among Mechanics now on the pension roll of the fund as follows:	
26 Men on annual pensions aggregating \$19,410	143,008
Total Pensions Entered Upon	\$557,406
Pensions to such Clerks as will retire from the present active force of 12,277 clerks:	
Men	\$4,421,891
Women	453,166
Pensions to such Laborers as will retire from the present active force of 12,015 laborers:	
Men	1,564,426
Women	79,529
Pensions to such Mechanics as will retire from the present active force of 6,064 mechanics	3,088,175
Pensions to such Exempt employees as will retire from the present active force of 2,500 employees	1,315,711
Pensions to such Elected employees as will retire from the present active force of 172 employees	585,494
Pensions to such Appointed employees as will retire from the present active force of 160 employees	196,954
Total Pensions not Entered Upon	\$11,705,346
Grand Total	\$12,262,752

and liabilities of the City of New York Employees' Retirement Fund as
as of that date:

**THE CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND—
JUNE 30, 1914.**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand.....	...
Contribution by Employees.....	...
*Deficiency.....	\$12,262,752
Grand Total.....	\$12,262,752

*NOTE—The law provides that pensions may be paid out of the excise moneys, but as no definite limit is placed on the amount of the excise moneys which may be used for this purpose, no estimate of the returns from this source has been made.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll,—that is, present pensioners.

TABLE 126—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

City of New York Employees' Retirement Fund

Years After Valuation	Date*	Pensions to Clerks	Pensions to Laborers	Pensions to Mechanics	Years After Valuation	Date*	Pensions to Clerks	Pensions to Laborers	Pensions to Mechanics
0	1914	\$43,109	\$18,045	\$18,776	25	1939	\$1,047	\$97	\$469
1	1915	39,457	16,400	17,596	26	1940	815	70	376
2	1916	35,927	14,816	16,408	27	1941	622	51	300
3	1917	32,557	13,294	15,220	28	1942	469	36	244
4	1918	29,416	11,853	14,037	29	1943	344	25	196
5	1919	26,406	10,495	12,867	30	1944	246	16	157
6	1920	23,597	9,228	11,720	31	1945	172	9	125
7	1921	21,001	8,054	10,603	32	1946	118	5	98
8	1922	18,610	6,974	9,525	33	1947	78	2	77
9	1923	16,414	5,987	8,492	34	1948	49	1	59
10	1924	14,413	5,093	7,514	35	1949	29	...	45
11	1925	12,600	4,291	6,596	36	1950	18	...	33
12	1926	10,966	3,567	5,742	37	1951	9	...	24
13	1927	9,502	2,930	4,953	38	1952	5	...	17
14	1928	8,194	2,377	4,237	39	1953	2	...	12
15	1929	7,032	1,894	3,592	40	1954	...	...	8
16	1930	6,004	1,489	3,018	41	1955	...	...	5
17	1931	5,099	1,148	2,513	42	1956	...	...	3
18	1932	4,306	875	2,076	43	1957	...	...	2
19	1933	3,618	655	1,700	44	1958	...	...	1
20	1934	3,015	484	1,385	45	1959	...	...	...
21	1935	2,493	354	1,121	46	1960	...	...	...
22	1936	2,041	256	903					
23	1937	1,654	185	729					
24	1938	1,325	133	584					
					Total.....				
					\$382,779 \$141,189 \$184,158				

*Date—Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the City of New York Employees' Retirement Fund, expressed as a percentage of the employee's salary.

TABLE 127—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE PENSION BENEFIT OF THE CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND.

Age at Entrance	Clerks	Laborers	Mechanics	Age at Entrance	Clerks	Laborers	Mechanics
20	.63	.26	.77	31	1.23	.56	1.30
21	.67	.28	.81	32	1.29	.59	1.34
22	.71	.30	.85	33	1.35	.62	1.39
23	.75	.32	.90	34	1.41	.65	1.43
24	.80	.35	.95	35	1.47	.68	1.47
25	.85	.38	1.00	36	1.53	.71	1.51
26	.91	.40	1.05	37	1.58	.74	1.54
27	.97	.43	1.10	38	1.63	.77	1.57
28	1.03	.46	1.15	39	1.68	.80	1.59
29	1.10	.49	1.20	40	1.72	.82	1.61
30	1.16	.53	1.25	..	...	...	...

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Department of Street Cleaning Relief and Pension Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

TO EMPLOYEES

- (1) Upon application after 20 years' service and attainment of 60 years of age, a pension of not less than one-half final salary.
The average allowance has been about 51 per cent. of final salary.
- (2) Upon disability incurred in the actual performance of duty, a pension of \$300.
- (3) Upon disability resulting from any cause after 10 years' service, a pension of not less than one-half final salary.
The average allowance has been about 51 per cent. of final salary.
Pensions to employees are for life and are not revocable if granted under provisions (1) and (3).

TO WIDOWS OF EMPLOYEES OR PENSIONERS

- (4) Upon death of an employee in actual performance of duty, a pension of a discretionary amount, not to exceed \$300 per annum.
The average annuity has been about \$300.
- (5) Upon death of an employee resulting from causes not connected with the performance of duty and occurring after 10 years' service, a pension of a discretionary amount, not to exceed \$200 per annum.
The average annuity has been about \$200.
- (6) Upon death of a pensioned employee, a pension of a discretionary amount, not to exceed \$200 per annum.
The average annuity has been about \$200.
Pensions to widows are terminated automatically by the death or remarriage of the widow and are revocable.

TO CHILDREN OF EMPLOYEES OR PENSIONERS

- (7) Upon death of an employee in actual performance of duty, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$200 per annum.
The average annuity during lifetime of the youngest child has been about \$200.

- (8) Upon death of an employee resulting from any cause after 10 years' service, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$200 per annum.

The average annuity during lifetime of the youngest child has been about \$200.

- (9) Upon death of a pensioned employee provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$200 per annum.

The average annuity during lifetime of the youngest child has been about \$200.

Pensions to children are terminated by death, marriage or attainment of age 18.

TO DEPENDENT PARENTS OF EMPLOYEES

- (10) Upon death of an employee in actual performance of duty, a pension of a discretionary amount, not to exceed \$200 per annum to widowed mother.

The average annuity has been about \$200.

- (11) Upon death of an employee from any cause after 10 years' service, a pension of a discretionary amount, not to exceed \$200 per annum to widowed mother.

The average annuity has been about \$200.

- (12) Upon death of a pensioned employee,* a pension of a discretionary amount, not to exceed \$200 per annum to widowed mother.

Pensions to dependent parents are terminated automatically by death or remarriage and are revocable.

Contributions

BY EMPLOYEES

Three percentum of salaries.

BY CITY

Indirect contributions:

Miscellaneous revenues, such as fines and deductions from employees' salaries on account of loss of time; proceeds of sales of departmental property, except real estate; proceeds of sales of incumbrances found in streets, and moneys collected for the release of such property; all moneys received for the privilege of scow trimming or assorting of refuse; all moneys received from the sale or disposal of ashes, garbage and refuse, and unexpended balances of appropriations for salaries.

Direct contributions:

None provided.

*The liability for these pensions has not been computed because of remote contingency upon which they are payable.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws, it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal.

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in the actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305 of this report.

BASIC DATA AND THEIR DEVELOPMENT**Schedules included**

The schedules used to give a basis for rates and valuation were those of the uniformed force and those of the clerical force. The clerical force, however, represents only about 2% of the total number of active employees.

Special methods of handling data

Before considering certain modifications made in the experience before it was used as a basis for exposure tables, it is perhaps advisable to present the following table which gives a summary of the cards reporting separations from the active service.

TABLE 128—SUMMARY OF THE TOTAL NUMBER OF SEPARATIONS FROM ACTIVE SERVICE, CLASSIFIED BY YEARS AND CAUSE OF SEPARATION, AS REPORTED

Department of Street Cleaning Relief and Pension Fund

CAUSE OF SEPARATION	NUMBER OF SEPARATIONS—YEAR ENDING JUNE 30						TOTAL
	1909	1910	1911	1912	1913	1914	
Resignation and Dismissal...	218	189	224	1,216	204	139	2,190
Death.....	79	80	95	111	62	60	487
Disability.....	...	...	...	32	217	123	372
Service Retirement.....	...	...	...	3	16	7	26
Total.....	297	269	319	1,362	499	329	3,075

The number of dismissals in 1912 was greatly in excess of the numbers occurring in other years. Investigation showed that a large number of the dismissals in 1912 were caused by a strike and that conditions in that year could not be used as indicative of future conditions, without adjustment; therefore, in preparing the rates of dismissal, a reduction was made in the rate derived directly from the experience. This reduction brought the rate

to what it would have been had the dismissals shown in the year of the strike been about the same as in a normal year.

As the pension law was not in effect prior to 1912 the experience is slightly different from what it would have been had the privilege of retirement been available throughout the entire period under observation. Consequently it was necessary, in order that rates for final use might be developed directly from the experience, to make certain adjustments in the data so that this condition might be properly taken into account. As a basis for such adjustment it was assumed that some of those who resigned or were dismissed in the three years of the experience previous to the passage of the pension law would have retired if the law had been in operation at that time.

The total separations from the service for the three age groups—20-39; 40-50; 51-65—were divided by cause and by year of separation. For each year was then computed the ratio of separations for each cause to the total separations. The ratios showed that the relative number of resignations was greatly reduced and the relative number of deaths slightly reduced in the two years, 1913, 1914, as compared with the years prior to 1912. This was probably the result of persons going out on pension who would have been forced to resign or remain in service until death, had no pension law been in effect. The number of separations in 1912 was so affected by the strike that that year was not considered in the adjustments to be made. The distributions of the total separations by cause, as shown in the experience of 1913 and of 1914, were then taken as a basis for adjusting the separations occurring in the first four years of the experience in such a manner that they would be distributed by cause in about the same proportions as they probably would have been had the retirement law been in effect throughout the entire experience.

Care was taken to make these adjustments conservatively and reasonably. The individual reports were studied to avoid inconsistencies, and an effort was made to secure a natural distribution which would afford an easy graduation of rates by preventing an artificial grouping of cases in any one age. The fact must be remembered that although these modifications in the assigned cause of separation were necessary before the data could be used as a basis for tables, they did not influence in any way the total rate of withdrawal from the active service, as the changes in the reports of the cause of separation were so effected as to make no changes whatever in the total rate of separations reported, in the number reported for any one year, or in the totals as regards the ages of employees at separation, with the single exception of the reduction made because of the strike. The extent of the changes made may be obtained by comparing the following summary showing the separations as reclassified with the preceding table showing the separations as originally reported.

TABLE 129—SUMMARY OF THE TOTAL NUMBER OF SEPARATIONS FROM ACTIVE SERVICE, CLASSIFIED BY YEARS AND CAUSE OF SEPARATION, AS MODIFIED BY THE PENSION COMMISSION

Department of Street Cleaning Relief and Pension Fund

CAUSE OF SEPARATION	NUMBER OF SEPARATIONS—YEAR ENDING JUNE 30						TOTAL
	1909	1910	1911	1912	1913	1914	
Resignation and Dismissal...	205	177	189	391	204	139	1,305
Death.....	55	51	59	113	62	60	400
Disability.....	36	39	67	32	217	123	514
Service Retirement.....	1	2	4	3	16	7	33
Total.....	297	269	319	539	499	329	2,252

Tabulations showing the number of separations from service brought out the fact that about 9% of the force left the service each year. This gross rate of separation indicated that the experience could not be used on an aggregate basis. A second tabulation was therefore made, in which the number of separations occurring in each of the first three years of service were tabulated separately for each year and separations occurring after the third year were combined. In this way the gross rate of separation was reduced from approximately 17% for employees in the first year of service to approximately 7% for employees with three completed years of service.

The following tables show the total numbers exposed to risk which were used as a basis for the rates for the active service and the pensioners.

TABLE 130—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Department of Street Cleaning Relief and Pension Fund

Years of Service	Exposed to Risk	WITHDRAWALS			Deaths	Separations by Disability	Service Retirements	Total Separations
		Resignations	Dismissals	Total				
One	3214.0	151	357	508	35	...	..	543
Two	3255.0	59	222	281	28	1	..	310
Three	3060.5	63	209	272	32	...	..	304
Ultimate	26383.5	244	885	1,129	392	371	26	1,918
Total..	35913.0	517	1,673	2,190	487	372	26	3,075

TABLE 131—SUMMARY OF EXPOSURE—SALARY

Department of Street Cleaning Relief and Pension Fund

Class	Number of Annual Salaries	Total Payroll
Active Members.....	23,856	\$19,803,910
Pensioned Members.....	1,081	932,950
Total.....	24,937	\$20,736,860

TABLE 132—SUMMARY OF EXPOSURE AND SEPARATIONS—EMPLOYEE PENSIONERS

Department of Street Cleaning Relief and Pension Fund

Class	Exposed to Risk	Deaths
Disability Pensioners.....	364	68
Service Pensioners.....	26	3
Total.....	390	71

The methods employed in the graduation of rates on the basis of select and ultimate experience have been outlined. In the Street Cleaning Department the rates of resignation and dismissal are primarily affected by length of service. These rates were therefore graduated directly from the data, but other rates for select years of experience were derived from the ultimate rates as described on page 29.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

Rates developed on a select basis are compared first with rates developed on the same basis and then with aggregate rates. In order to make comparison with aggregate rates the select and ultimate rates have been respectively multiplied into a standard service exposure, which has been subdivided by years of service, and the expected cases of separation obtained in this way have been contrasted with the cases obtained by use of the comparative aggregate rate and the same exposure. This method is explained in detail on pages 392 and 393.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 254 to 257, showing the rates plotted on cross section paper.

TABLE 133—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Department of Street Cleaning Relief and Pension Fund

AGE	RATES OF DEATH		RATES OF DISABILITY										Rate of Service Retirement	
			IN PERFORMANCE OF DUTY					NOT IN PERFORMANCE OF DUTY						Total Ultimate
			$a^4q_{[x-2]+2}^{(a)}$	$a^4q_{[x-1]+1}^{(a)}$	$a^4q_{[x-2]+2}^{(a)}$	$a^4q_{[x-1]+1}^{(a)}$	$a^4q_{[x]}^{(a)}$	$a^4q_{[x-1]+1}^{(a)}$	$a^4q_{[x-2]+2}^{(a)}$	$a^4q_{[x]}^{(a)}$	${}^4q_x^{(a)}$			
...	...	.0001	...	...	...	...	...	...	...	...	...	...
20	...	...	.0001	.0001	...	...	...	...	...	...	...	...	...
21	...	...	.0001	.0001	.0001	...	...	...	...	...	...	...	...
22	.0048	...	.0001	.0001	.0001	.0001	...	...	...	...	...	...	...
23	.0052	.0053	.0001	.0001	.0001	.0001	.0001	...	...	...	...	.0001	...
24	.0056	.0058	.0001	.0001	.0001	.0001	.0001	...	...	...	...	.0001	...
25	.0060	.0062	.0001	.0001	.0001	.0001	.0001	...	...	...	...	.0001	...
26	.0064	.0067	.0001	.0001	.0001	.0001	.0001	...	...	...	...	.0001	...
27	.0069	.0071	.0001	.0001	.0001	.0001	.0001	.0000	.0000	...	...	.0002	...
28	.0074	.0076	.0002	.0002	.0002	.0002	.0002	.0000	.0000	...	...	.0002	...
29	.0079	.0080	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0000	...	.0003	...
30	.0083	.0084	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0001	.0006	...	
31	.0087	.0088	.0003	.0003	.0003	.0003	.0003	.0007	.0008	.0008	.0008	.0011	...	
32	.0090	.0091	.0003	.0003	.0003	.0003	.0003	.0013	.0014	.0015	.0015	.0018	...	
33	.0093	.0094	.0004	.0004	.0004	.0004	.0004	.0017	.0018	.0019	.0019	.0023	...	
34	.0095	.0096	.0004	.0004	.0004	.0004	.0004	.0022	.0024	.0025	.0025	.0029	...	
35	.0098	.0099	.0004	.0005	.0005	.0005	.0005	.0027	.0029	.0030	.0030	.0035	...	
36	.0100	.0101	.0005	.0005	.0005	.0005	.0005	.0031	.0033	.0035	.0035	.0040	...	
37	.0103	.0104	.0005	.0005	.0006	.0006	.0006	.0038	.0041	.0042	.0042	.0048	...	
38	.0105	.0106	.0005	.0006	.0006	.0006	.0006	.0043	.0046	.0047	.0047	.0053	...	
39	.0107	.0108	.0005	.0006	.0006	.0006	.0006	.0051	.0054	.0056	.0056	.0062	...	
40	.0110	.0111	.0006	.0006	.0006	.0006	.0006	.0058	.0062	.0064	.0064	.0070	...	
41	.0112	.0113	...	.0006	.0006	.0006	.0006	...	.0067	.0069	.0069	.0075	...
42	.0114	.0115	...	...	.0006	.0006	.0006	...	...	.0076	.0076	.0082	...
43	...	.0116	...	...	.0006	.0006	.0006	...	...	.0085	.0085	.0091	...
44	...	.0118	...	...	.0006	.0006	.0006	...	...	.0094	.0094	.0100	...
45	...	.0119	...	...	.0006	.0006	.0006	...	...	.0100	.0100	.0106	...
46	...	.0120	...	...	.0005	.0005	.0005	...	...	.0110	.0110	.0115	...
47	...	.0121	...	...	.0005	.0005	.0005	...	...	.0120	.0120	.0125	...
48	...	.0122	...	...	.0005	.0005	.0005	...	...	.0130	.0130	.0135	...
49	...	.0124	...	...	.0004	.0004	.0004	...	...	.0141	.0141	.0145	...
50	...	.0125	...	...	.0004	.0004	.0004	...	...	.0152	.0152	.0156	...
51	...	.0126	...	...	.0003	.0003	.0003	...	...	.0166	.0166	.0169	...
52	...	.0127	...	...	.0003	.0003	.0003	...	...	.0179	.0179	.0182	...
53	...	.0129	...	...	.0003	.0003	.0003	...	...	.0199	.0199	.0202	...
54	...	.0130	...	...	.0002	.0002	.0002	...	...	.0220	.0220	.0222	...

TABLE 133—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Department of Street Cleaning Relief and Pension Fund

AGE	RATES OF DEATH		RATES OF DISABILITY							Total Ultimate	Rate of Service Retirement	
	$q_{[x-2]+2}^{(a)}$	$q_x^{(a)}$	IN PERFORMANCE OF DUTY			NOT IN PERFORMANCE OF DUTY						
			$a^1r_q^{(a)}_{[x]}$	$a^1r_q^{(a)}_{[x-1]+1}$	$a^1r_q^{(a)}_{[x-2]+2}$	$a^1r_q^{(a)}_x$	$a^1r_q^{(a)}_{[x-1]+1}$	$a^1r_q^{(a)}_{[x-2]+2}$	$a^1r_q^{(a)}_x$			
550132	...	...	...	...	...	...	...	...	.0250	...
560134	...	...	...	...	...	...	...	...	.0281	...
570135	...	...	...	...	...	...	...	...	.0325	...
580137	...	...	...	...	...	...	...	...	.0387	...
590139	...	...	...	...	...	...	...	...	.0499	...
600142	...	...	...	...	...	...	...	...	.0670	.0093
610145	...	...	...	...	...	...	...	...	.0810	.0183
620148	...	...	...	...	...	...	...	...	.0935	.0259
630152	...	...	...	...	...	...	...	...	.1045	.0327
640156	...	...	...	...	...	...	...	...	.1140	.0395
650161	...	...	...	...	...	...	...	...	.1220	.0459
660167	...	...	...	...	...	...	...	...	.1278	.0525
670173	...	...	...	...	...	...	...	...	.1332	.0589
680180	...	...	...	...	...	...	...	...	.1385	.0657
690188	...	...	...	...	...	...	...	...	.1440	.0727
700195	...	...	...	...	...	...	...	...	.1488	.0797
710204	...	...	...	...	...	...	...	...	.1540	.0878
720222	...	...	...	...	...	...	...	...	.1590	.0960
730223	...	...	...	...	...	...	...	...	.1638	.1050
740239	...	...	...	...	...	...	...	...	.1685	.1142
750253	...	...	...	...	...	...	...	...	.1720	.1242
760270	...	...	...	...	...	...	...	...	.1760	.1350
770289	...	...	...	...	...	...	...	...	.1798	.1470
780316	...	...	...	...	...	...	...	...	.1826	.1597
790332	...	...	...	...	...	...	...	...	.1859	.1728
800356	...	...	...	...	...	...	...	...	.1887	.1870
810383	...	...	...	...	...	...	...	...	.1918	.2030
820406	...	...	...	...	...	...	...	...	.1945	.2200
830443	...	...	...	...	...	...	...	...	.1972	.2380
840475	...	...	...	...	...	...	...	...	.2000	.2590
850508	...	...	...	...	...	...	...	...	.2030	.2810
8605452050	.3060
8705832075	.3310
8806252100	.3610
8906702135	.3920

SECTION II

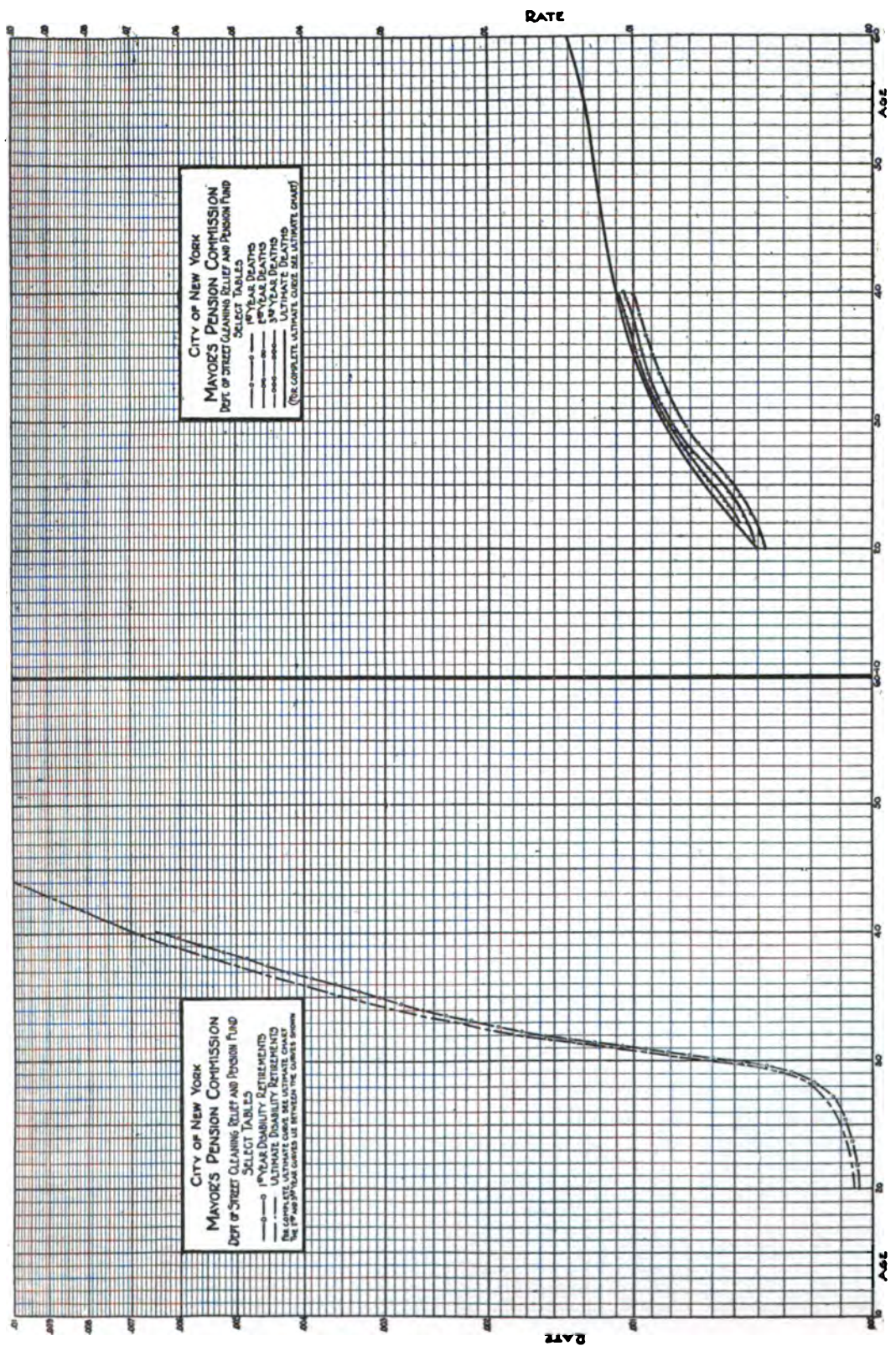
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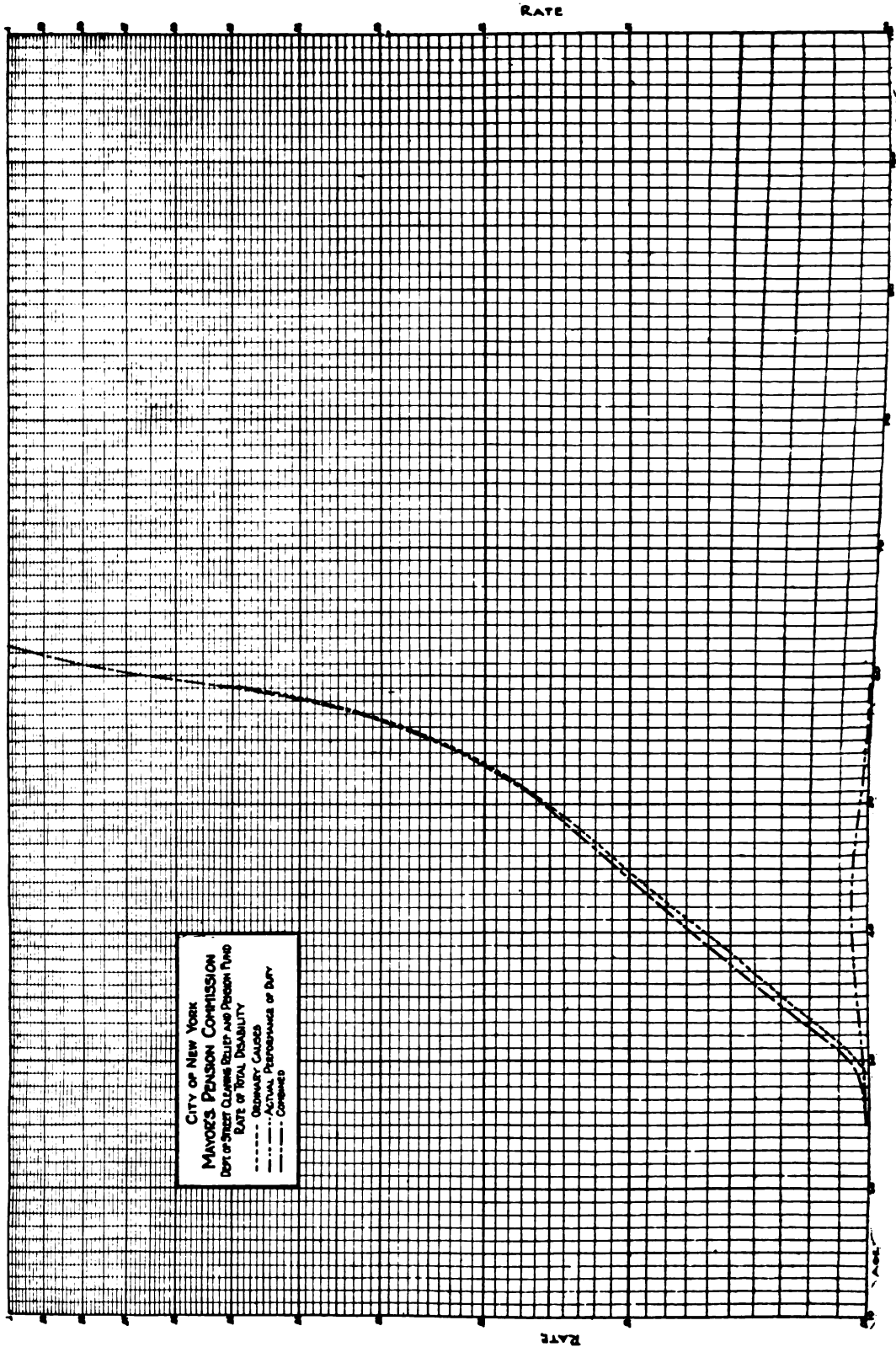
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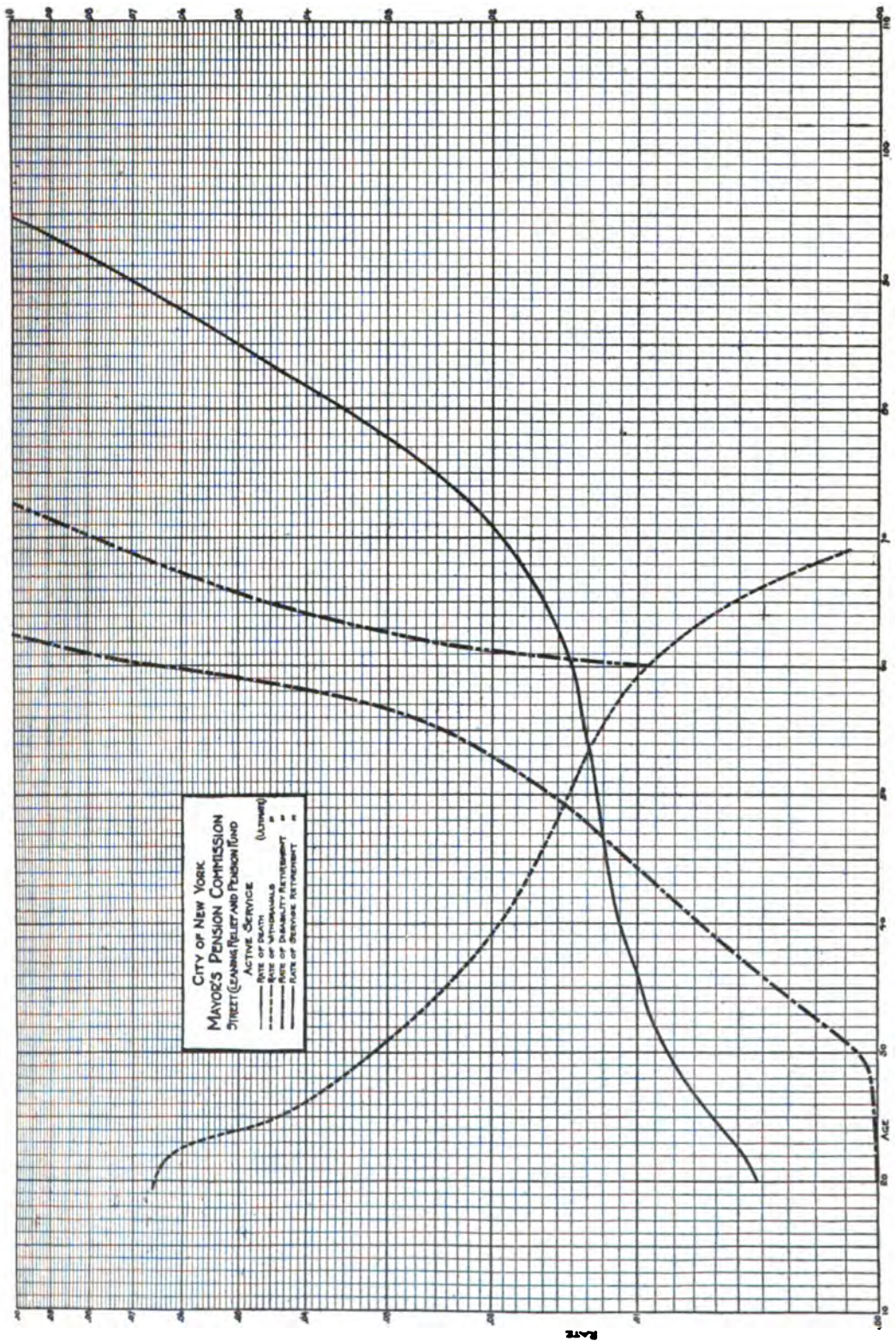
CITY OF NEW YORK
MAYOR'S PENSION COMMISSION
DEPT OF STREET CLEANING BRUSH AND PENSION FUND
SELECT TABLES
----- 15 YEAR DESIGNATIONS
----- 20 YEAR DESIGNATIONS
----- 25 YEAR DESIGNATIONS
----- 30 YEAR DESIGNATIONS
----- 35 YEAR DESIGNATIONS
----- 40 YEAR DESIGNATIONS
----- 45 YEAR DESIGNATIONS
----- 50 YEAR DESIGNATIONS
----- 55 YEAR DESIGNATIONS
----- 60 YEAR DESIGNATIONS
----- 65 YEAR DESIGNATIONS
----- 70 YEAR DESIGNATIONS
----- 75 YEAR DESIGNATIONS
----- 80 YEAR DESIGNATIONS
----- 85 YEAR DESIGNATIONS
----- 90 YEAR DESIGNATIONS
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----- 100 YEAR DESIGNATIONS
(THE COMPLETE ULTIMATE CURVE SEE ULTIMATE CHART)

CITY OF NEW YORK
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----- 70 YEAR DESIGNATIONS
----- 75 YEAR DESIGNATIONS
----- 80 YEAR DESIGNATIONS
----- 85 YEAR DESIGNATIONS
----- 90 YEAR DESIGNATIONS
----- 95 YEAR DESIGNATIONS
----- 100 YEAR DESIGNATIONS
(THE COMPLETE ULTIMATE CURVE SEE ULTIMATE CHART)

RATE







RATES OF RESIGNATION AND DISMISSAL

The rate of resignation in the Street Cleaning Department is the lowest of all similar rates developed on a select basis. The corresponding rate for the division laborers, of the City of New York Employees' Retirement Fund, is the next higher rate and is more than double that for street cleaners during the first year of service and about three times that rate in the ultimate years. Considering the select and ultimate rates together and weighing them according to their relative importance we find that, as an aggregate rate, the street cleaners' rate of resignation ranks about fifth among the seven rates of resignation for city departments reporting such a rate and lies between the corresponding rate for laborers and that for policemen.

The rate of dismissal, unlike that of resignation, is the highest of all such rates in the city service and this is true not only of the select rate for the first year and of the ultimate rate, but also of the aggregate rate derived by combining the select and the ultimate rates weighed according to their relative importance. The corresponding rate for the division, laborers of City of New York Employees' Retirement Fund, ranks second to that for street cleaners as a rate of dismissal.

The aggregate rate of withdrawal made up of the rates of dismissal and of resignation combined, ranks sixth among all rates of withdrawal in the city service and lies between the rate for mechanics, which is higher, and that for women teachers, which is lower. Apparently the employees of the Street Cleaning Department generally prefer to remain in service; and the withdrawals are largely the result of dismissal for breach of discipline or physical unfitness for duty.

RATE OF DEATH

Two rates of death in the active service were needed for valuation purposes, one covering deaths in performance of duty and the other covering other deaths. As the reports did not give sufficient experience regarding deaths in performance of duty to afford a basis for the development of such a rate, a single rate of death was prepared and the assumption was made that a certain proportion of all the deaths which occurred in the service were the result of actual performance of duty.

A bulletin of the United States Bureau of Labor Statistics, No. 157, on Industrial Accident Statistics, gives the ratio of accidental deaths to total deaths by occupations in the registration area of the United States for the years 1908-1909. According to this report among teamsters 13.7% of the total deaths are accidental; among hostlers, 9.8%; among non-agricultural laborers, 9.9%. According to the statistics of the Prudential Life Insurance Company, quoted in this same volume, based on the period 1907 to 1912, 12.2% of total deaths among draymen and teamsters are accidental. That the cost of the benefit allowed in the Street Cleaning Department on accidental death might be fully covered 12.5% of total deaths were assumed to occur in actual performance of duty. This ratio would place the rate about first of all departments having accidental death rates. As the statistics on the experience of the fund accumulate the actual data may show this assumption to be slightly high or low, but as the benefit allowed on ac-

cidental death is not costly as compared with other benefits of the fund, no material effect on the entire liability of the fund will probably result.

Because of the method employed in determining the value of benefits on death in performance of duty no rate of death from other causes need be discussed.

The total rate of death considered as an aggregate rate stands about fourth among all corresponding rates and is higher than any other rate with the exception of that for the classes considered in the City of New York Employees' Fund who have no disability allowance which is available during their first thirty years of service.

RATE OF DISABILITY

Two rates of disability for the Street Cleaning Department were required, one for disability in performance of duty and one for disability from other causes. The rate of disability in performance of duty could not be developed from the data because they appeared insufficient to yield a true rate. The law allows a pension of \$300 per annum in case of disability in performance of duty, while after ten years of service it allows, for disability from other causes, a pension of half salary. Evidently persons disabled after ten years of service would not claim upon the ground that they were disabled in performance of duty, as a larger pension could be secured under the general disability provision. This condition would seem to indicate that a rate of disability in the actual performance of duty derived from the experience, even if the experience had been larger than it was, would have reflected only cases of such disability as had accrued in the first ten years of service. The Commission, therefore, derived a single rate of disability from the experience and then subdivided this rate into the two rates required. In the calculation of the cost of pensions the clause covering disability in performance of duty was considered to apply only to cases of disability in performance of duty which occur in the first ten years of service. All cases of disability from any cause after ten years of service were valued as coming under the other provision.

The rate of disability in performance of duty follows the general form of similar rates for the city service. The rate is the lowest for the four funds for which such rates were derived.

The rate of disability not in performance of duty, taken as a whole, is the second highest rate among corresponding rates in the city service and is exceeded only by that for policemen.

The two rates taken together as a single total rate of disability form a rate which is second as regards all corresponding rates of the city service. It is exceeded by the corresponding rates for the Police Department and followed by that for the Fire Department.

RATE OF SERVICE RETIREMENT

The rate of service retirement, as has previously been explained, was adopted after allowance had been made in the other rates of withdrawal for its introduction. The rate taken as a whole up to age 65, ranks lowest among all retirement rates applying to city funds, the next higher rate being for laborers.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

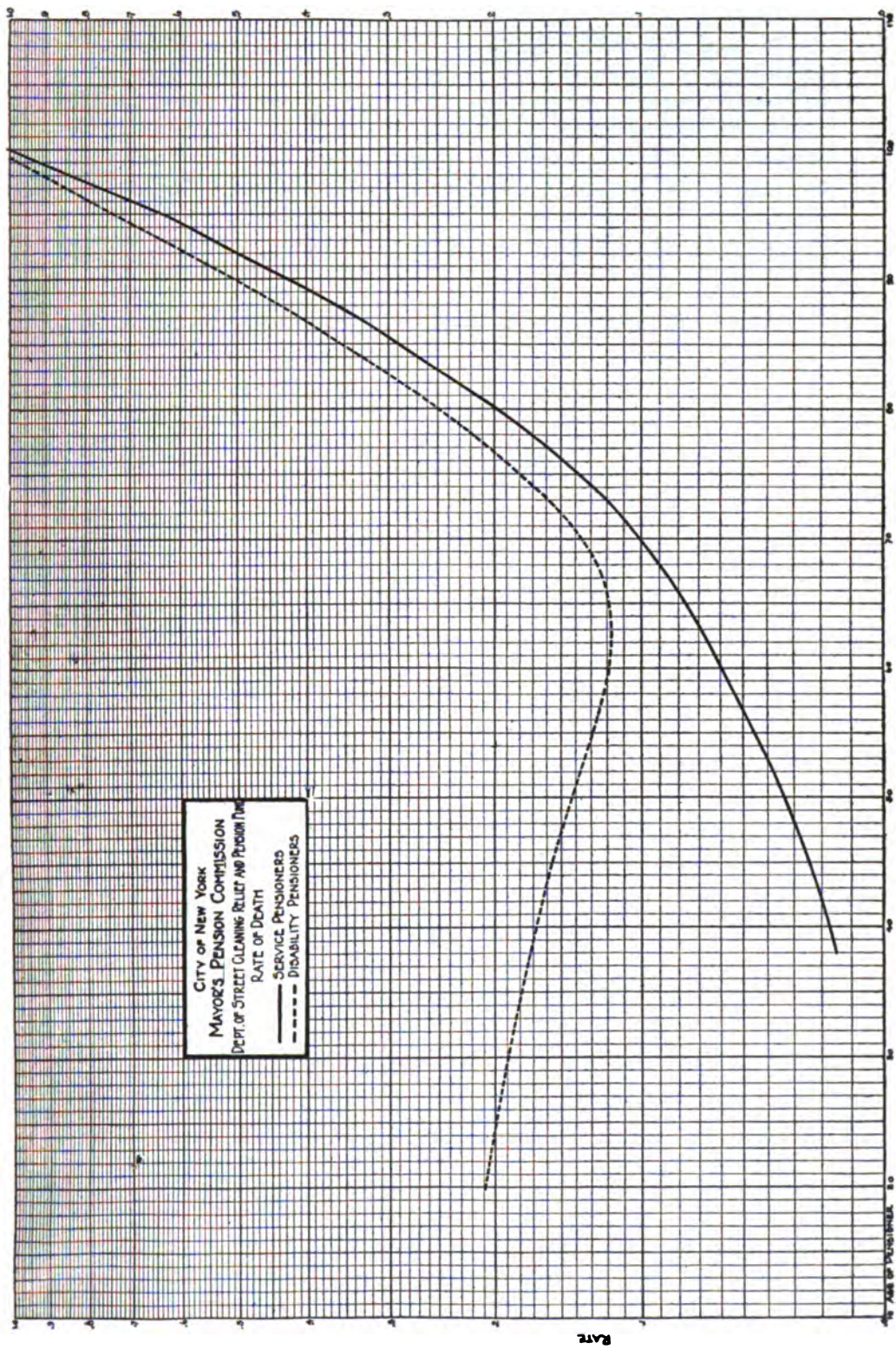
Pensioners

The following table shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross section paper is given on page 261.

TABLE 134—RATES OF MORTALITY AMONG PENSIONERS

Department of Street Cleaning Relief and Pension Fund

Age	Disability	Service	Age	Disability	Service
20	.2080	...	60	.1205	.0605
21	.2070	...	61	.1192	.0636
22	.2050	...	62	.1185	.0668
23	.2030	...	63	.1180	.0700
24	.2010	...	64	.1185	.0739
25	.1992	...	65	.1194	.0776
26	.1975	...	66	.1208	.0818
27	.1960	...	67	.1230	.0860
28	.1940	...	68	.1262	.0909
29	.1920	...	69	.1302	.0960
30	.1900	...	70	.1360	.1019
31	.1880	...	71	.1430	.1080
32	.1862	...	72	.1520	.1150
33	.1845	...	73	.1610	.1220
34	.1822	...	74	.1725	.1300
35	.1805	...	75	.1825	.1390
36	.1780	...	76	.1940	.1500
37	.1758	...	77	.2050	.1605
38	.1735	...	78	.2180	.1725
39	.1710	...	79	.2325	.1865
40	.1688	...	80	.2500	.2030
41	.1663	...	81	.2675	.2180
42	.1640	...	82	.2875	.2360
43	.1617	...	83	.3085	.2530
44	.1595	...	84	.3302	.2720
45	.1570	...	85	.3560	.2910
46	.1545	...	86	.3802	.3140
47	.1520	...	87	.4100	.3380
48	.1493	...	88	.4400	.3660
49	.1468	...	89	.4700	.3950
50	.1440	...	90	.5050	.4270
51	.1415	...	91	.5450	.4620
52	.1385	...	92	.5900	.5000
53	.1358	...	93	.6350	.5400
54	.1330	...	94	.6850	.5900
55	.1302	...	95	.7350	.6400
56	.1280	...	96	.7900	.7200
57	.1255	...	97	.8500	.7750
58	.1236	...	98	.9150	.8450
59	.1220	...	99	.9800	.9200



DISABILITY PENSIONERS' DEATH RATE

The rate of mortality among disability pensioners of the Street Cleaning Department is generally the highest of all similar departmental rates; the rate used for valuing pensions in the Supreme Court funds and the Fire Department fund being the next two highest rates. It falls generally between the mortality rate derived by Franklin Mead from the experience of the Order of the Maccabees and the rate derived by Sidney Pipe from the experience of Fraternal Orders in Canada. It remains higher throughout than Hunter's rate derived from various funds, which is used by some of the insurance companies for valuing certain annuities on disabled lives.

SERVICE PENSIONERS' DEATH RATE

The experience was not sufficiently complete to give a probable rate of mortality for service pensioners; a rate was therefore adopted which had been based on a similar experience. It is a little lower than the rate applying to disability pensioners but it is higher than standard rates of mortality, and is the highest rate of mortality used in the valuation of service pensions.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The construction of mortality tables and select service tables has been described. The following tables are based on the rates discussed above:

TABLE 135—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE
Department of Street Cleaning Relief and Pension Fund

STREET CLEANERS

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AGE	LIVING				WITHDRAWALS					Dismissals	
					Resignations						
	$l_{[z]}^{(a)}$	$l_{[z-1]+1}^{(a)}$	$l_{[z-3]+3}^{(a)}$	$l_{[z]}^{(a)}$	$r_{w_{[z]}}^{(a)}$	$r_{w_{[z-1]+1}}^{(a)}$	$r_{w_{[z-3]+3}}^{(a)}$	$r_{w_{[z]}}^{(a)}$	$d_{w_{[z]}}^{(a)}$	$d_{w_{[z-1]+1}}^{(a)}$	
20	1,000,000										
21	975,932	886,005	...	...	47,000	...	...	...	62,200	...
22	959,536	842,507	807,511	...	44,990	33,968	...	...	84,516	41,507
23	922,621	805,899	758,014	...	43,659	30,920	24,952	...	106,029	49,624	
24	871,486	766,672	716,400	741,060	41,334	28,287	21,755	...	110,622	57,219	
25	812,098	724,334	678,284	693,456	38,258	25,760	18,985	17,155	104,840	58,574	
26	752,352	681,428	642,685	655,249	34,920	23,179	16,618	11,827	91,605	54,325	
27	697,917	640,291	609,756	621,978	31,712	20,988	14,653	10,013	76,138	46,473	
28	651,691	603,603	579,499	592,379	28,859	18,066	12,805	8,411	61,137	37,778	
29	614,111	571,819	551,995	565,621	26,393	16,901	11,242	7,183	49,073	30,301	
30	583,825	544,262	526,998	541,192	24,441	15,325	9,936	6,213	40,900	24,988	
31	557,404	520,409	504,311	518,673	22,838	14,042	8,906	5,447	35,905	21,226	
32	533,873	498,866	483,644	497,599	21,349	13,010	7,918	4,822	32,273	18,839	
33	512,246	478,894	464,161	477,760	20,020	12,023	7,162	4,300	29,737	17,400	
34	491,739	460,407	445,788	441,052	18,953	11,206	6,498	3,910	27,508	16,522	
35	472,683	442,596	428,592	424,124	17,899	10,497	5,884	3,551	25,718	15,792	
36	453,232	425,559	412,096	408,007	16,922	9,781	5,357	3,236	24,532	15,049	
37	435,411	408,950	396,269	392,699	15,954	9,150	4,904	2,962	22,571	14,383	
38	417,885	392,931	380,918	377,996	15,065	8,588	4,478	2,726	21,466	13,495	
39	401,294	377,320	366,453	363,942	14,250	8,094	4,114	2,499	20,309	12,378	
40	385,369	362,333	352,448	350,327	13,544	7,622	3,774	2,307	19,222	11,055	
41	...	348,023	339,016	337,137	12,756	7,210	3,524	2,119	18,266	9,783	
42	...	...	326,209	324,451	...	6,786	3,322	1,949	...	8,701
43	...	...	...	312,164	...	...	3,099	1,704	...	...
44	...	...	...	300,199	...	...	...	1,648	...	...
45	...	...	...	288,545	...	...	...	1,504	...	...
46	...	...	...	277,274	...	...	...	1,379	...	...
47	...	...	...	266,299	...	...	...	1,253	...	...
48	...	...	...	255,586	...	...	...	1,134	...	...
49	...	...	...	245,133	...	...	...	1,022	...	...
50	...	...	...	234,935	...	...	...	922	...	...
51	...	...	...	224,978	...	...	...	825	...	...
52	...	...	...	215,209	...	...	...	734	...	...
53	...	...	...	205,643	...	...	...	648	...	...
54	...	...	...	196,130	...	...	...	573	...	...
55	...	...	...	186,722	...	...	...	500	...	...
								431	...	...

TABLE 135—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
 Department of Street Cleaning Relief and Pension Fund

Age	LIVING				WITHDRAWALS				Dismissals	
	Resignations									
	$l_{[s]}^{(a)}$	$l_{[s-1]+1}^{(a)}$	$l_{[s-2]+3}^{(a)}$	$l_{[s]}^{(a)}$	$r_{w[s]}^{(a)}$	$r_{w[s-1]+1}^{(a)}$	$r_{w[s-2]+3}^{(a)}$	$r_{w[s]}^{(a)}$	$d_{w[s]}^{(a)}$	$d_{w[s-1]+1}^{(a)}$
56	177,294	...	...	...	372	...	...
57	107,835	...	...	...	314	...	...
58	158,200	...	...	...	259	...	...
59	148,173	...	...	...	210	...	...
60	137,186	...	...	...	165	...	...
61	133,455	...	...	...	124	...	...
62	108,300	...	...	...	86	...	...
63	92,886	...	...	...	56	...	...
64	78,951	...	...	...	31	...	...
65	64,355	...	...	...	13	...	...
66	52,163	...	...	...	...	...	...
67	41,659	...	...	...	...	...	...
68	32,794	...	...	...	...	...	...
69	25,432	...	...	...	...	...	...
70	19,415	...	...	...	...	...	...
71	14,000	...	...	...	...	...	...
72	10,772	...	...	...	...	...	...
73	7,787	...	...	...	...	...	...
74	5,521	...	...	...	...	...	...
75	3,820	...	...	...	...	...	...
76	2,598	...	...	...	...	...	...
77	1,720	...	...	...	...	...	...
78	1,108	...	...	...	...	...	...
79	694	...	...	...	...	...	...
80	422	...	...	...	...	...	...
81	248	...	...	...	...	...	...
82	141	...	...	...	...	...	...
83	77	...	...	...	...	...	...
84	40	...	...	...	...	...	...
85	20	...	...	...	...	...	...
86	9	...	...	...	...	...	...
87	4	...	...	...	...	...	...
88	2	...	...	...	...	...	...
89	1	...	...	...	...	...	...

TABLE 135—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
Department of Street Cleaning Relief and Pension Fund

Age	Withdrawals			Deaths	Separations by Disability				Service Re- tirements	Salary Scale
	Dismissals		Total Ultimate		In Performance of Duty	Other Causes	Total			
	$dw_{[s-2]+3}^{(g)}$	$dw_{\frac{s}{2}}^{(g)}$								
								$d_{[s]}^{(g)}$ $d_{[s-1]+1}^{(g)}$ $d_{[s-2]+2}^{(g)}$ $d_{\frac{s}{2}}^{(g)}$		
20	...	...	...	46	...	...	46	...	$s_{[s-1]+1}^{(s)}$ $s_{[s-2]+2}^{(s)}$ $s_{\frac{s}{2}}$	752
21	...	...	...	49	...	...	49	...		760
22	37,550	...	...	53	...	...	53	...		770
23	38,810	26,456	43,611	58	...	...	58	...		778
24	38,112	20,110	34,153	60	...	...	60	...		785
25	35,543	17,299	29,126	69	...	...	69	...		792
26	31,492	15,425	25,438	75	...	...	75	...		799
27	27,012	13,979	22,390	84	...	...	84	...		804
28	22,659	12,540	20,023	94	...	...	94	...		810
29	18,878	11,798	18,011	107	...	...	107	...		815
30	15,810	10,944	16,391	119	...	...	119	...		819
31	13,717	10,101	14,923	134	...	...	134	...		822
32	12,338	9,316	13,616	153	...	...	153	...		823
33	11,233	8,582	12,492	172	...	...	172	...		827
34	10,254	7,851	11,402	189	...	...	189	...		828
35	9,558	7,211	10,447	203	...	...	203	...		829
36	8,736	6,589	9,551	211	...	...	211	...		830
37	7,846	6,028	8,754	216	...	...	216	...		831
38	6,856	5,549	8,048	218	...	...	218	...		832
39	6,157	5,113	7,420	217	...	...	217	...		833
40	5,463	4,747	6,866	213	...	...	213	...		834
41	4,916	4,410	6,359	206	...	...	206	...		835
42	4,567	4,114	5,968	198	...	...	198	...		836
43	...	3,846	5,494	188	...	...	188	...		837
44	...	3,611	5,115	177	...	...	177	...		838
45	...	3,399	4,778	164	...	...	164	...		838
46	...	3,197	4,450	150	...	...	150	...		839
47	...	3,017	4,151	135	...	...	135	...		839
48	...	2,850	3,872	120	...	...	120	...		839
49	...	2,692	3,614	104	...	...	104	...		839
50	...	2,540	3,365	89	...	...	89	...		840
51	...	2,403	3,137	75	...	...	75	...		840
52	...	2,270	2,918	64	...	...	64	...		840
53	...	2,139	2,712	54	...	...	54	...		840
54	...	2,004	2,504	45	...	...	45	...		840
55	...	1,867	2,298	38	...	...	38	...		841

TABLE 135—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
Department of Street Cleaning Relief and Pension Fund

AGE	WITHDRAWALS			Deaths	SEPARATIONS BY DISABILITY			Service Re- tirements	Salary Scale
	Dismissals		Total Ultimate		In Performance of Duty	Other Causes	Total		
	$d_{w[x-2]+3}$	$d_{w[x]}$							
56	...	1,734	2,106	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+1}$	31	4,951	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+1}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+1}$	$s_{[x]}^{(a)}$
57	...	1,594	1,908	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+1}$	26	5,429	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+1}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+1}$	$s_{[x-1]+1}^{(a)}$
58	...	1,455	1,714	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	22	6,117	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	$s_{[x-2]+2}^{(a)}$
59	...	1,304	1,514	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	17	7,392	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	$s_{[x]}^{(a)}$
60	...	1,152	1,317	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	13	9,178	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	1,276
61	...	981	1,105	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	10	9,990	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	2,359
62	...	801	887	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	8	10,119	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	2,805
63	...	627	683	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	5	9,702	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	851
64	...	468	499	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	4	8,894	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	853
65	...	338	351	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	2	7,849	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	855
66	...	230	230	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	1	6,665	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	858
67	...	142	142	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	1	5,548	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	860
68	...	76	76	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	4,541	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	861
69	...	29	29	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	3,662	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	863
70	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	2,889	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	865
71	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	2,248	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	867
72	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	1,712	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	870
73	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	1,275	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	871
74	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	930	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	873
75	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	659	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	877
76	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	457	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	880
77	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	309	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	881
78	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	202	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	884
79	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	120	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	888
80	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	80	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	890
81	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	48	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	893
82	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	27	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	896
83	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	15	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	899
84	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	8	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	900
85	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	4	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	901
86	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	2	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	903
87	$\frac{d_{[x-1]}^{(a)}}{d_{[x-1]}^{(a)}+2}$	...	1	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	907
88	$\frac{d_{[x-2]}^{(a)}}{d_{[x-2]}^{(a)}+2}$	...	...	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	910
89	$\frac{d_{[x]}^{(a)}}{d_{[x]}^{(a)}+2}$	...	...	$\frac{a_1^{(a)}(a)}{a_1^{(a)}(a)+2}$	$\frac{t_r^{(a)}(a)}{t_r^{(a)}(a)+2}$	912

TABLE 136—DISABILITY PENSIONERS' MORTALITY TABLE

Department of Street Cleaning Relief and Pension Fund

Age	Living $l_x^{(0)}$	Dying $d_x^{(0)}$	Age	Living $l_x^{(0)}$	Dying $d_x^{(0)}$
20	2,000,000	416,000	55	2,468	321
21	1,584,000	327,888	56	2,147	275
22	1,256,112	257,503	57	1,872	235
23	998,609	202,718	58	1,637	202
24	795,891	159,974	59	1,435	175
25	635,917	126,674	60	1,260	152
26	509,243	100,576	61	1,108	132
27	408,667	80,099	62	976	116
28	328,568	63,742	63	860	101
29	264,826	50,847	64	759	90
30	213,979	40,656	65	669	80
31	173,323	32,584	66	589	71
32	140,739	26,206	67	518	64
33	114,533	21,131	68	454	57
34	93,402	17,018	69	397	52
35	76,384	13,787	70	345	47
36	62,597	11,143	71	298	42
37	51,454	9,045	72	256	39
38	42,409	7,358	73	217	35
39	35,051	5,994	74	182	32
40	29,057	4,905	75	150	27
41	24,152	4,016	76	123	24
42	20,136	3,302	77	99	20
43	16,834	2,722	78	79	17
44	14,112	2,251	79	62	15
45	11,861	1,862	80	47	12
46	9,999	1,545	81	35	9
47	8,454	1,285	82	26	7
48	7,160	1,070	83	19	6
49	6,099	896	84	13	4
50	5,203	749	85	9	3
51	4,454	630	86	6	3
52	3,824	530	87	3	1
53	3,294	447	88	2	1
54	2,847	379	89	1	1

TABLE 137—SERVICE PENSIONERS' MORTALITY TABLE**Department of Street Cleaning Relief and Pension Fund**

Age	Living $l_z^{(p)}$	Dying $d_z^{(p)}$	Age	Living $l_z^{(p)}$	Dying $d_z^{(p)}$
38	42,408	679	68	10,845	986
39	41,720	717	69	9,859	946
40	41,012	763	70	8,913	909
41	40,249	805	71	8,004	864
42	39,444	848	72	7,140	821
43	38,596	888	73	6,319	771
44	37,708	927	74	5,548	721
45	36,781	957	75	4,827	671
46	35,824	989	76	4,156	624
47	34,835	1,020	77	3,532	567
48	33,815	1,048	78	2,965	511
49	32,767	1,082	79	2,454	458
50	31,685	1,109	80	1,996	405
51	30,576	1,137	81	1,591	347
52	29,439	1,166	82	1,244	294
53	28,273	1,185	83	950	240
54	27,088	1,197	84	710	193
55	25,891	1,212	85	517	150
56	24,679	1,216	86	367	116
57	23,463	1,220	87	251	85
58	22,243	1,221	88	166	60
59	21,022	1,209	89	106	42
60	19,813	1,199	90	64	27
61	18,614	1,184	91	37	17
62	17,430	1,164	92	20	10
63	16,266	1,139	93	10	5
64	15,127	1,118	94	5	3
65	14,009	1,087	95	2	1
66	12,922	1,057	96	1	1
67	11,865	1,020	..	..	..

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 244. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 138—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS, PAYABLE TO THESE MEMBERS AND THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1,000, FOR VALUES DETERMINED BY SALARY AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Department of Street Cleaning Relief and Pension Fund

AGE AT ENTRANCE	*Total Future Salary	Total of All Pension Benefits	PENSIONS TO MEMBERS				PENSIONS TO WIDOWS				PENSIONS TO CHILDREN				PENSIONS TO DEPENDENT PARENTS	
			Total	Upon Service Retirement	UPON DISABILITY		Total	Of MEMBERS DYING IN SERVICE	Of Members Dying While on Pension	Total	Of MEMBERS DYING IN SERVICE	Of Members Dying While on Pension	Total	Of MEMBERS DYING IN SERVICE	Total	Of MEMBERS DYING IN SERVICE
					In Per- formance of Duty During First 10 Years of Service	All Causes After 10 Years of Service										
20	\$10,639	\$387	\$154	\$18	\$1	\$135	\$136	\$27	\$94	\$72	\$1	\$7	\$11	\$3	\$29	\$4
25	10,044	495	210	26	1	183	184	37	101	102	2	6	12	4	33	4
30	10,790	674	318	43	3	272	275	51	115	150	2	6	13	5	27	4
35	10,495	799	419	64	5	350	355	55	107	184	2	5	12	5	22	3
40	9,972	925	533	95	5	433	438	55	91	213	2	4	11	5	22	3

*Total future salary estimated without use of $or\frac{1}{2}$ column, which was used to obtain cost of service pension only.

The expectation of life and present value of a pension of one to service and disability pensioners are shown in the following table:

TABLE 139—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

Department of Street Cleaning Relief and Pension Fund

AGE	ANNUITY VALUE		EXPECTATION OF LIFE		AGE	ANNUITY VALUE		EXPECTATION OF LIFE	
	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners		Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners
20	3.80	...	4.49	...	60	5.71	7.69	7.09	10.03
21	3.83	...	4.53	...	61	5.66	7.45	6.99	9.64
22	3.86	...	4.59	...	62	5.59	7.22	6.87	9.27
23	3.90	...	4.64	...	63	5.50	6.99	6.73	8.89
24	3.94	...	4.69	...	64	5.40	6.76	6.56	8.52
25	3.98	...	4.75	...	65	5.28	6.53	6.38	8.17
26	4.01	...	4.81	...	66	5.15	6.30	6.17	7.81
27	4.05	...	4.87	...	67	5.00	6.07	5.95	7.46
28	4.10	...	4.93	...	68	4.83	5.84	5.72	7.12
29	4.14	...	5.00	...	69	4.66	5.60	5.47	6.78
30	4.18	...	5.06	...	70	4.47	5.37	5.21	6.44
31	4.23	...	5.13	...	71	4.28	5.14	4.94	6.12
32	4.28	...	5.21	...	72	4.08	4.91	4.70	5.80
33	4.33	...	5.28	...	73	3.89	4.69	4.45	5.49
34	4.38	...	5.37	...	74	3.71	4.46	4.21	5.18
35	4.44	...	5.45	...	75	3.53	4.23	3.99	4.88
36	4.50	...	5.54	...	76	3.35	4.01	3.76	4.59
37	4.56	...	5.63	...	77	3.18	3.79	3.55	4.31
38	4.62	...	5.73	...	78	3.01	3.58	3.34	4.04
39	4.68	...	5.82	...	79	2.84	3.37	3.13	3.77
40	4.75	...	5.92	...	80	2.67	3.17	2.92	3.53
41	4.81	...	6.02	...	81	2.51	2.98	2.73	3.30
42	4.88	...	6.13	...	82	2.35	2.80	2.54	3.08
43	4.95	...	6.23	...	83	2.20	2.63	2.37	2.87
44	5.02	...	6.33	...	84	2.06	2.46	2.20	2.67
45	5.10	...	6.44	...	85	1.92	2.30	2.04	2.49
46	5.17	...	6.55	...	86	1.79	2.14	1.90	2.30
47	5.24	...	6.65	...	87	1.65	1.99	1.75	2.13
48	5.32	...	6.75	...	88	1.54	1.84	1.62	1.96
49	5.39	...	6.85	...	89	1.44	1.70	1.50	1.80
50	5.46	...	6.95	...	90	1.33	1.57	1.38	1.65
51	5.53	...	7.03	...	91	1.22	1.44	1.27	1.51
52	5.59	...	7.11	...	92	1.11	1.32	1.14	1.37
53	5.64	...	7.17	...	93	.94	1.20	1.00	1.24
54	5.69	...	7.22	...	94	.90	1.08	.95	1.11
55	5.73	...	7.25	...	95	...	.96	...	.98
56	5.75	...	7.26	...	96	...	.83	...	.84
57	5.76	...	7.25	...	97	...	.78	...	.79
58	5.76	...	7.22	...	98	...	.72	...	.75
59	5.74	...	7.16	...	99	...	...	...	...

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 140—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE.

Department of Street Cleaning Relief and Pension Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
19	1	\$540	5,426	\$4,533,370	51	178	\$148,710	1,490	\$1,247,590
20	...	...	5,425	4,533,370	52	151	126,690	1,312	1,098,880
21	1	600	5,425	4,532,830	53	134	111,080	1,161	972,190
22	6	4,240	5,424	4,532,230	54	103	134,370	1,027	861,110
23	25	10,580	5,418	4,527,990	55	133	114,090	864	726,740
24	90	72,010	5,393	4,508,410	56	93	76,600	731	612,650
25	102	83,540	5,303	4,436,400	57	95	79,400	638	536,050
26	86	68,520	5,201	4,352,860	58	99	82,450	543	456,650
27	73	58,990	5,115	4,284,340	59	82	71,160	444	374,200
28	96	77,950	5,042	4,225,350	60	82	66,060	362	303,040
29	99	80,300	4,946	4,147,400	61	49	39,050	280	236,980
30	116	96,000	4,847	4,067,100	62	46	39,670	231	197,930
31	114	95,050	4,731	3,971,100	63	41	34,730	185	158,260
32	129	108,220	4,617	3,876,050	64	41	37,320	144	123,530
33	112	91,940	4,488	3,767,830	65	29	23,630	103	86,210
34	113	93,040	4,376	3,675,890	66	21	17,170	74	62,580
35	156	126,590	4,263	3,582,850	67	13	10,760	53	45,410
36	143	115,670	4,107	3,456,260	68	10	8,660	40	34,650
37	153	130,160	3,964	3,340,590	69	10	8,880	30	25,990
38	182	154,000	3,811	3,210,430	70	6	4,750	20	17,110
39	178	155,980	3,629	3,056,430	71	1	780	14	12,360
40	163	134,570	3,451	2,900,450	72	4	3,500	13	11,580
41	176	146,570	3,288	2,765,880	73	1	760	9	8,080
42	205	181,090	3,112	2,619,310	74	3	2,740	8	7,320
43	162	140,760	2,907	2,438,220	75	1	780	5	4,580
44	223	185,090	2,745	2,297,460	76	...	...	4	3,800
45	204	170,540	2,522	2,112,370	77	1	1,040	4	3,800
46	168	140,160	2,318	1,941,830	78	...	...	3	2,760
47	165	138,760	2,150	1,801,670	79	1	780	3	2,760
48	152	127,790	1,985	1,662,910	80	...	...	2	1,980
49	155	128,340	1,833	1,535,120	81	1	1,200	2	1,980
50	188	159,190	1,678	1,406,780	82	1	780	1	780

TABLE 141—NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY LENGTH OF SERVICE WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES, WHO HAVE HAD THE INDICATED SERVICE OR MORE

Department of Street Cleaning Relief and Pension Fund

Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	86	\$68,740	5,426	\$4,533,370	16	167	\$145,680	910	\$831,010
1	135	111,420	5,340	4,404,630	17	120	104,710	743	685,330
2	420	336,190	5,205	4,353,210	18	177	151,850	623	580,620
3	797	640,100	4,785	4,017,020	19	184	173,050	446	428,770
4	276	219,720	3,988	3,376,920	20	84	86,630	262	255,720
5	362	288,130	3,712	3,157,200	21	52	49,200	178	169,090
6	118	96,120	3,350	2,869,070	22	61	53,060	126	119,890
7	389	312,330	3,232	2,772,950	23	13	12,340	65	66,830
8	293	239,560	2,843	2,460,620	24	13	16,250	52	54,490
9	313	252,680	2,550	2,221,060	25	15	14,550	39	38,240
10	282	230,550	2,237	1,968,380	26	5	4,690	24	23,690
11	211	173,190	1,955	1,737,830	27	4	5,120	19	19,000
12	183	151,790	1,744	1,564,640	28	4	3,960	15	13,880
13	116	98,790	1,561	1,412,850	29	1	1,250	11	9,920
14	134	124,020	1,445	1,314,060	30 & over	10	8,670	10	8,670
15	401	359,030	1,311	1,190,040					

TABLE 142—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund

Age	Number	Pensions	Age	Number	Pensions
35	1	\$400	63	8	\$3,120
36	1	390	64	19	8,190
37	..	...	65	19	7,960
38	..	...	66	14	5,660
39	1	300	67	19	7,680
40	3	1,180	68	19	7,960
41	3	2,050	69	11	4,950
42	5	2,170	70	10	6,030
43	2	850	71	9	4,100
44	1	600	72	7	2,720
45	3	1,840	73	4	1,560
46	4	2,070	74	2	770
47	3	1,530	75	5	2,120
48	4	3,170	76	..	...
49	4	1,560	77	3	1,620
50	2	770	78	2	950
51	6	2,560	79	3	1,360
52	3	1,170	80	..	...
53	6	2,550	81	1	390
54	7	2,770	82	..	...
55	4	1,560	83	1	390
56	8	3,210	84	..	...
57	7	3,060	85	..	...
58	7	3,320	86	..	...
59	11	4,370	87	..	...
60	15	5,860	88	1	390
61	7	2,710			
62	25	10,260	Total	300	\$130,200

TABLE 143—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund

Age	Number	Pensions	Age	Number	Pensions
60	1	\$390	70	3	\$1,420
61	1	400	71	..	...
62	2	780	72	2	810
63	2	1,000	73	2	1,160
64	1	390	74	1	390
65	..	...	75	1	390
66	3	2,550	76	1	450
67	..	...	
68	1	460			
69	..	...	Total	21	\$10,590

TABLE 144—NUMBER AND PENSIONS OF ALL WIDOW PENSIONERS* CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund.

Age	Number	Pensions	Age	Number	Pensions
28	1	\$300	58	3	\$600
29	1	200	59	4	800
30	1	300	60	2	400
31	1	300	61	2	400
32	2	400	62	2	400
33	..	...	63	1	200
34	1	200	64	6	1,300
35	3	600	65	1	300
36	2	400	66	..	...
37	2	400	67	1	200
38	2	500	68	1	200
39	1	200	69	..	...
40	2	500	70	..	...
41	4	900	71	..	...
42	3	600	72	2	400
43	3	600	73	1	200
44	6	1,200	74	1	200
45	3	600	75	..	...
46	2	400	76	..	...
47	1	200	77	..	...
48	3	600	78	..	...
49	4	800	79	..	...
50	6	1,200	80	..	...
51	6	1,200	81	..	...
52	3	700	82	..	...
53	4	800	83	..	...
54	6	1,200	84	..	...
55	3	600	85	1	200
56	3	600			
57	2	400	Total	109	\$22,700

*Includes 3 dependent parent pensioners.

TABLE 145—NUMBER AND PENSIONS OF ALL CHILDREN PENSIONERS CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund

Age	Number	Pensions	Age	Number	Pensions
15	4	\$200	18	3	210
16	..	...	
17	..	...	Totals	7	\$410

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets Fund as of June 30, 1914, and shows the complete financial condition of the

TABLE 146—A VALUATION OF ASSETS AND LIABILITIES OF PENSION FUND—VALUED

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 437 Pensioners now on the pension roll of the fund, as follows:	
Service Pensioners:	
21 Annual pensions aggregating \$10,590	\$62,228
Disability Pensioners:	
300 Annual pensions aggregating 130,200	654,468
Widow Pensioners:	
106 Annual pensions aggregating 22,100	280,175
Children Pensioners:	
7 Annual pensions aggregating 410	669
Dependent Parent Pensioners:	
3 Annual pensions aggregating 600	4,198
Total Pensions Entered Upon.....	\$1,001,738
Pensions to Dependents of present pensioners:	
Widows' Pensions:	
Widows of Service Pensioners.....	\$16,010
Widows of Disability Pensioners.....	340,600
Children's Pensions:	
Children of Service Pensioners.....	166
Children of Disability Pensioners.....	8,942
Total Prospective Pensions to Dependents of Present Pensioners.....	\$365,718
Pensions to such Employees as will retire from the present force of 5,426 employees:	
Service Pensions.....	\$837,535
Disability Pensions, on account of:	
Actual Performance of Duty during first 10 years of service...	7,569
All Causes after 10 years' service.....	3,352,571
Total Prospective Pensions to Employees.....	\$4,197,675
Pensions to Dependents of such employees of the present active force as will die in service, or while on pension:	
Widows' Pensions:	
Widows of employees who will die in Actual Performance of Duty.....	\$272,862
Widows of employees who will die from Other Causes after 10 years' service.....	991,572
Widows of employees who will die as Service Pensioners.....	266,612
Widows of employees who will die as Disability Pensioners...	1,726,632
Children's Pensions:	
Children of employees who will die in Actual Performance of Duty.....	9,284
Children of employees who will die from Other Causes after 10 years' service.....	46,176
Children of employees who will die as Service Pensioners.....	2,945
Children of employees who will die as Disability Pensioners..	45,478
Dependent Parents' Pensions.....	83,478
Total Prospective Pensions to Dependents of Employees in Service.....	\$3,445,039
Total Pensions Not Entered Upon.....	\$8,008,432
Grand Total.....	\$9,010,170

and liabilities of the Department of Street Cleaning Relief and Pension fund as of that date:

**THE DEPARTMENT OF STREET CLEANING RELIEF AND
AS OF JUNE 30, 1914**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand.....	\$838,767
Contribution of 3 Percentum of Future Salaries by Employees.....	1,316,533
*Deficiency	6,854,870
Grand Total.....	\$9,010,170

*NOTE—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$3,510,800.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 147—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL
Department of Street Cleaning Relief and Pension Fund

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total	Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
0	1914	\$120,551	\$10,047	\$21,850	\$305	\$573	\$153,326	36	1950	\$50	...	\$2,987	...	\$2	\$3,039
1	1915	104,007	9,971	21,242	199	525	135,044	37	1951	36	...	2,690	...	1	2,727
2	1916	89,648	8,143	20,734	198	479	119,202	38	1952	26	...	2,413	...	...	2,439
3	1917	77,138	7,206	20,174	...	436	105,014	39	1953	18	...	2,155	...	...	2,173
4	1918	66,107	6,440	19,612	...	396	92,645	40	1954	12	...	1,917	...	...	1,929
5	1919	56,609	5,669	19,046	...	359	81,773	41	1955	8	...	1,697	...	...	1,705
6	1920	48,323	4,953	18,477	...	324	72,077	42	1956	3	...	1,495	...	...	1,498
7	1921	41,077	4,208	17,904	...	292	63,571	43	1957	2	...	1,311	...	...	1,313
8	1922	34,733	3,692	17,327	...	263	50,015	44	1958	1	...	1,145	...	...	1,146
9	1923	29,281	3,147	16,746	...	235	49,409	45	1959	...	...	994	...	...	994
10	1924	24,499	2,658	16,161	...	209	43,527	46	1960	...	...	858	...	...	858
11	1925	20,422	2,223	15,574	...	185	38,404	47	1961	...	...	739	...	...	739
12	1926	16,911	1,842	14,984	...	165	33,002	48	1962	...	...	632	...	...	632
13	1927	13,949	1,592	14,393	...	148	29,992	49	1963	...	...	538	...	...	538
14	1928	11,410	1,223	13,801	...	133	26,507	50	1964	...	...	454	...	...	454
15	1929	9,493	978	13,208	...	120	23,709	51	1965	...	...	381	...	...	381
16	1930	7,528	772	12,618	...	107	21,025	52	1966	...	...	315	...	...	315
17	1931	6,003	601	12,030	...	96	18,790	53	1967	...	...	259	...	...	259
18	1932	4,864	460	11,445	...	85	16,354	54	1968	...	...	212	...	...	212
19	1933	3,880	336	10,865	...	75	15,156	55	1969	...	...	171	...	...	171
20	1934	3,084	256	10,292	...	66	13,698	56	1970	...	...	137	...	...	137
21	1935	2,444	186	9,726	...	57	12,413	57	1971	...	...	109	...	...	109
22	1936	1,931	131	9,169	...	49	11,280	58	1972	...	...	85	...	...	85
23	1937	1,523	92	8,622	...	42	10,279	59	1973	...	...	66	...	...	66
24	1938	1,197	61	8,088	...	36	9,382	60	1974	...	...	59	...	...	59
25	1939	939	40	7,567	...	31	8,577	61	1975	...	...	37	...	...	37
26	1940	735	26	7,062	...	27	7,850	62	1976	...	...	27	...	...	27
27	1941	576	16	6,572	...	23	7,187	63	1977	...	...	19	...	...	19
28	1942	448	9	6,098	...	19	6,574	64	1978	...	...	13	...	...	13
29	1943	347	5	5,642	...	16	6,010	65	1979	...	...	9	...	...	9
30	1944	269	2	5,203	...	13	5,487	66	1980	...	...	5	...	...	5
31	1945	207	1	4,782	...	11	5,001	67	1981	...	...	2	...	...	2
32	1946	156	...	4,381	...	8	4,545	68	1982	...	...	1	...	...	1
33	1947	120	...	4,001	...	6	4,127								
34	1948	91	...	3,642	...	5	3,738								
35	1949	68	...	3,304	...	3	3,375								
Total		\$800,874	\$76,146	\$156,405	\$74	\$156,405	\$1,310,601								

*Date year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSION TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Department of Street Cleaning, expressed as a percentage of the employee's salary:

TABLE 148—RATES OF CONTRIBUTION, EXPRESSED AS PERCENTAGES OF SALARIES, NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

AGE AT ENTRANCE	PENSION TO EMPLOYEES					PENSION TO WIDOWS OF					PENSION TO CHILDREN OF					PENSION TO DEPENDENT PARENTS OF		
	Total	Service Pension	Disability Pension			Total (4)+(5)+(6)	Actives Dying		Pension- ers Dying (6)	Total (7)+(8)+(9)	Actives Dying		Pension- ers Dying (9)	Total (10)+(11)	Actives Dying			
			Total (2)+(3)	In Per- formance of Duty (2)	All Causes (3)		In Per- formance of Duty (4)	Not in Per- formance After 10 Years of Service (5)			In Per- formance of Duty (7)	Not in Per- formance After 10 Years of Service (8)			In Per- formance of Duty (10)	Not in Per- formance After 10 Years of Service (11)		
20	4.19	1.45	.17	1.28	.01	1.27	.31	1.10	.86	.13	.02	.07	.04	.34	.04	.30		
21	4.49	1.58	.19	1.39	.01	1.38	.34	1.14	.93	.14	.02	.08	.04	.36	.04	.32		
22	4.79	1.70	.20	1.50	.01	1.49	.37	1.18	1.01	.14	.02	.08	.04	.39	.05	.34		
23	5.09	1.84	.22	1.62	.01	1.61	.40	1.21	1.10	.14	.02	.08	.04	.40	.05	.35		
24	5.38	1.97	.24	1.73	.01	1.72	.43	1.24	1.18	.15	.02	.08	.05	.41	.05	.36		
25	5.68	2.12	.26	1.86	.02	1.84	.46	1.26	1.28	.15	.02	.08	.05	.41	.05	.36		
26	5.97	2.28	.29	1.99	.02	1.97	.49	1.29	1.36	.16	.03	.08	.05	.39	.05	.34		
27	6.26	2.44	.31	2.13	.03	2.10	.52	1.30	1.46	.16	.03	.07	.06	.38	.05	.33		
28	6.54	2.61	.34	2.27	.03	2.24	.55	1.32	1.55	.16	.03	.07	.06	.35	.04	.31		
29	6.82	2.79	.37	2.42	.04	2.38	.57	1.32	1.65	.16	.03	.07	.06	.33	.04	.29		
30	7.10	2.97	.40	2.57	.04	2.53	.59	1.33	1.74	.16	.03	.07	.06	.31	.04	.27		
31	7.37	3.16	.43	2.73	.04	2.69	.61	1.32	1.83	.16	.03	.07	.06	.29	.04	.25		
32	7.64	3.36	.47	2.89	.05	2.84	.62	1.31	1.92	.16	.03	.07	.06	.27	.03	.24		
33	7.95	3.57	.51	3.06	.05	3.01	.64	1.31	2.01	.16	.03	.06	.07	.26	.03	.23		
34	8.25	3.79	.56	3.23	.06	3.17	.66	1.29	2.10	.16	.03	.06	.07	.26	.03	.23		
35	8.55	4.02	.61	3.41	.06	3.35	.66	1.27	2.19	.15	.03	.05	.07	.26	.03	.23		
36	8.88	4.27	.66	3.61	.07	3.54	.67	1.25	2.28	.15	.03	.05	.07	.26	.03	.23		
37	9.21	4.52	.72	3.80	.07	3.73	.68	1.22	2.37	.15	.03	.05	.07	.27	.03	.24		
38	9.56	4.79	.79	4.00	.07	3.93	.68	1.20	2.47	.15	.03	.05	.07	.27	.03	.24		
39	9.92	5.08	.87	4.21	.07	4.14	.69	1.17	2.57	.13	.02	.05	.06	.28	.04	.24		
40	10.29	5.38	.95	4.43	.07	4.36	.69	1.14	2.67	.13	.02	.05	.06	.28	.04	.24		

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Supreme Court, First Department, Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

- (1) Upon application after 25 years' service in state, county or city of New York, the last 12½ years of which have been in positions covered by the act, a pension of one-half of average of last two years' salary.

In the discretion of the court, after 20 years' service, provided the last ten years of it have been in positions covered by this act, a pension of one-fiftieth of average of last two years' salary for each year of service.

- (2) Upon disability occurring after 20 years' service in state, county or city of New York, the last ten years of which have been in positions covered by the act, a pension of not more than one-half of average of last two years' salary.

The average allowance has been 50 per cent. of average last two years' salary.

Contributions

BY EMPLOYEES

One percentum of salary.

BY CITY

Indirect contributions:

Unexpended balances of salary appropriations.

Direct contributions:

Budgetary appropriation as required to pay maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of service retirement

Rate of disability retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The pension fund of the Supreme Court, First Department, covers all employees in the Supreme Court, First Department and certain divisions of the County Clerk's office which handle records of the Supreme Court, First Department, who contribute toward the fund. Contribution toward the fund is now compulsory on entrants into the positions covered by the law, although employees in the service in 1914 were given the option of becoming members.

In making the valuation the schedules for the employees were divided so that only the schedules for contributors were carried in the valuation for the Supreme Court, First Department, while the remainder were placed in the various classes of the City of New York Employees' Retirement Fund. The schedules used as a basis for the experience tables were, however, somewhat different from those considered in the valuation, as will be shown in the discussion which follows.

Special methods of handling data

As the law establishing the Supreme Court pension fund was not in operation during the entire period for which service experience was obtained by the Commission, the tabulation could not be used as a basis for developing rates of retirement or considered as indicative of such rates, unless modified to account for the probable experience had the law been in force during the entire period under observation. Since the experience was valuable mainly in deriving other service rates which could equally well be based on data for all the employees in this department, and since the experience based on contributors alone was very meagre, it seemed advisable to include all employees in the departments in the experience used as a basis for the required rates. Even with this combination the basis was of limited extent.

The Second Department of the Supreme Court has a pension fund for its employees and although all employees of the divisions covered by it are members of the fund, its experience was even smaller than that of the fund in the First Department. Since the type of the personnel and the duties and salaries of the members are about the same in the two departments, it seemed advisable to combine the experience of the two funds and use the combined data as a basis for certain rates to be applied to both funds. In making this combination the cards for employees in the county clerk's office were excluded in order that the experience might not include any persons who were not employed in the courts. The combined experience was used as a basis for developing a withdrawal rate and a death rate, whereas the experience of each of the two departments was considered separately in selecting the other rates to be used, which were adopted rates and not rates developed from the actual experience.

The tabulations used as a basis for salary scales were also combined. The reasons for this combination are given in the discussion of the salary scale. With these exceptions the general methods of handling the data were the same as those outlined in section I of this report.

The following summaries give the entire experience which was available for consideration in preparing the rates for both funds:

TABLE 149—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Supreme Court, First Department, Retirement Fund

Number Exposed to Risk.....	1,328.5
Total Number of Separations.....	50
Total Withdrawals.....	6
Resignations.....	6
Dismissals.....	..
Total Deaths.....	35
Total Separations by Disability.....	9
Total Service Retirements.....	..

Supreme Court, Second Department, Retirement Fund

Number Exposed to Risk.....	630
Total Number of Separations.....	18
Total Withdrawals.....	..
Resignations.....	..
Dismissals.....	..
Total Deaths.....	17
Total Separations by Disability.....	1

Supreme Court, First and Second Department, Retirement Funds—Combined

Number Exposed to Risk.....	1,958.5
Total Number of Separations.....	68
Total Withdrawals.....	6
Resignations.....	6
Dismissals.....	..
Total Deaths.....	52
Total Separations by Disability.....	10
Total Service Retirements.....	1

TABLE 150—SUMMARY OF EXPOSURE—SALARY

Supreme Court, First Department, Retirement Fund

Class	Number of Annual Salaries	Total Payroll
Active Members.....	997	\$2,263,700
Pensioned Members.....	29	63,600
Total.....	1,026	\$2,327,300

Supreme Court, Second Department, Retirement Fund

Class	Number of Annual Salaries	Total Payroll
Active Members.....	516	\$1,162,600
Pensioned Members.....	...	...
Total.....	516	\$1,162,600

Supreme Court, First and Second Department, Retirement Funds—Combined

Class	Number of Annual Salaries	Total Payroll
Active Members.....	1,513	\$3,426,300
Pensioned Members.....	29	63,600
Total.....	1,542	\$3,489,900

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

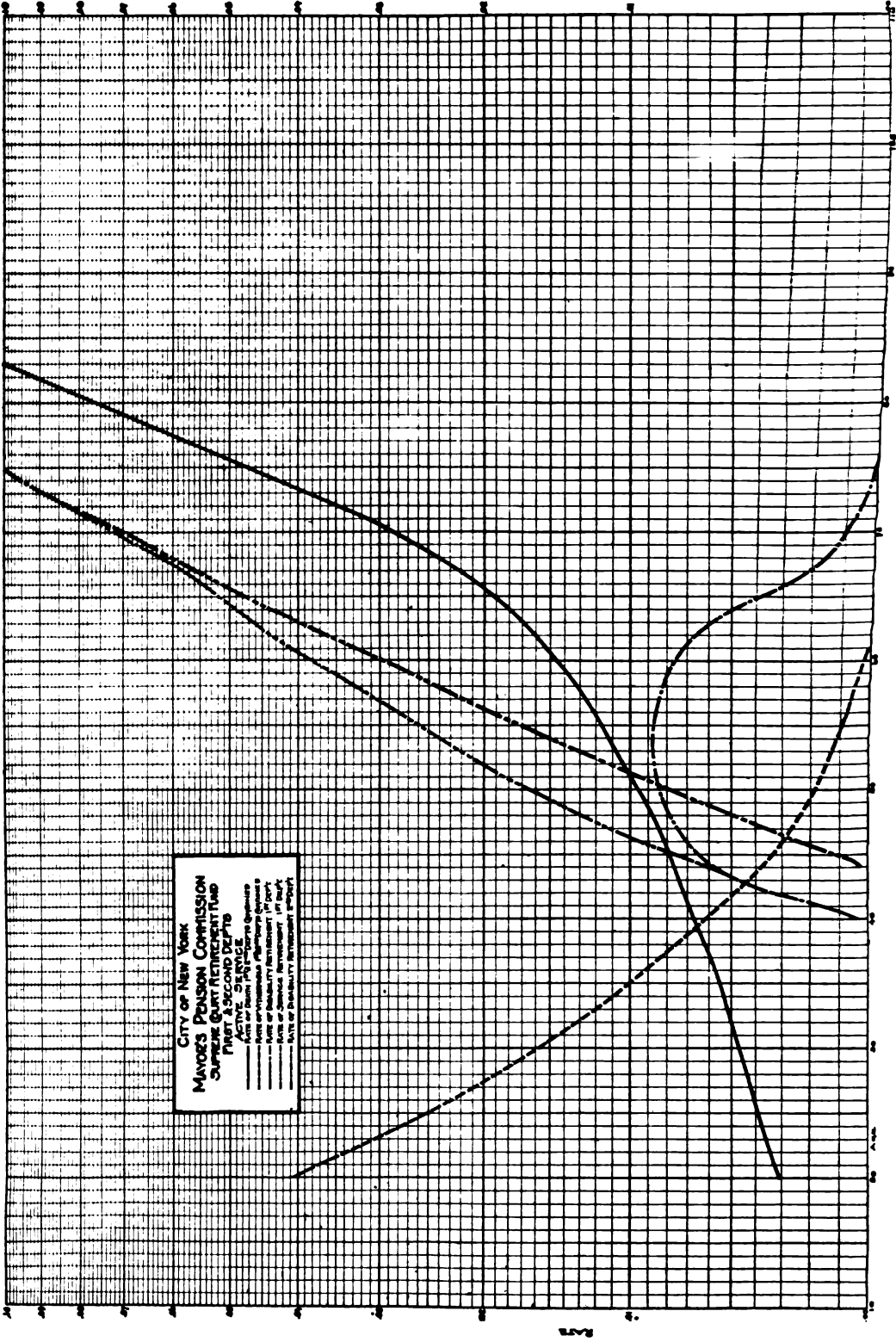
The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, a diagram is given on page 282, showing the rates plotted on cross section paper.

TABLE 151—RATES OF SEPARATION FROM ACTIVE SERVICE

Supreme Court, First Department, Retirement Fund

Age	Rate of With-drawal	Rate of Death	Rate of Disability Retirement	Rate of Service Retirement	Age	Rate of With-drawal	Rate of Death	Rate of Disability Retirement	Rate of Service Retirement
	$w q_z^{(a)}$	$d q_z^{(a)}$	$i_r q_z^{(a)}$	$s_r q_z^{(a)}$		$w q_z^{(a)}$	$d q_z^{(a)}$	$r q_z^{(a)}$	$s_r q_z^{(a)}$
20	.0402	.0031	...	...	56	.0007	.0122	.0086	.0198
21	.0366	.0033	...	...	57	.0006	.0127	.0085	.0220
22	.0331	.0034	...	...	58	.0004	.0133	.0083	.0247
23	.0302	.0036	...	...	59	.0003	.0139	.0080	.0271
24	.0273	.0037	...	...	60	.0002	.0146	.0077	.0301
25	.0248	.0039	...	...	61	.0001	.0153	.0072	.0333
26	.0227	.0040	...	...	62	...	.0162	.0067	.0368
27	.0207	.0042	...	...	63	...	.0171	.0060	.0400
28	.0188	.0044	...	...	64	...	.0181	.0051	.0439
29	.0172	.0045	...	...	65	...	.0192	.0040	.0477
30	.0157	.0047	...	...	66	...	.0205	.0029	.0519
31	.0142	.0049	...	...	67	...	.0220	.0022	.0561
32	.0130	.0050	...	...	68	...	.0239	.0017	.0609
33	.0120	.0052	...	...	69	...	.0260	.0013	.0659
34	.0109	.0054	...	...	70	...	.0285	.0010	.0710
35	.0100	.0056	...	...	71	...	.0315	.0007	.0770
36	.0091	.0058	...	...	72	...	.0350	.0005	.0830
37	.0083	.0060	...	...	73	...	.0385	.0004	.0895
38	.0075	.0062	...	...	74	...	.0426	.0002	.0965
39	.0068	.0064	...	...	75	...	.0473	.0001	.1040
40	.0061	.0067	.0005	...	76	...	.0525	...	.1125
41	.0054	.0069	.0018	...	77	...	.0578	...	.1215
42	.0048	.0071	.0036	...	78	...	.0635	...	.1310
43	.0043	.0074	.0049	...	79	...	.0696	...	.1420
44	.0038	.0077	.0058	.0003	80	...	.0763	...	.1543
45	.0034	.0079	.0065	.0014	81	...	.0835	...	.1675
46	.0030	.0082	.0071	.0026	82	...	.0915	...	.1830
47	.0027	.0085	.0075	.0038	83	...	.1000	...	.2010
48	.0023	.0088	.0079	.0050	84	...	.1095	...	.2225
49	.0021	.0092	.0082	.0066	85	...	.1193	...	.2490
50	.0018	.0095	.0084	.0080	86	...	.1293	...	.2850
51	.0016	.0099	.0086	.0098	87	...	.1399	...	.3375
52	.0014	.0103	.0087	.0113	88	...	.1510	...	.4250
53	.0012	.0107	.0088	.0132	89	...	.1623	...	.5900
54	.0010	.0112	.0088	.0151	90	...	.1735	...	.8265
55	.0009	.0116	.0087	.0172	..	...	.....	...	.....



RATES OF RESIGNATION AND DISMISSAL

A single rate of withdrawal, which includes both resignations and dismissals, was prepared for the Supreme Court, First Department, Retirement Fund. This rate is the lowest rate developed for any branch of the city services with the single exception of the Fire Department. The next higher rate is that applicable to the pension fund of the Police Department. A low rate in such a department as the Supreme Court would seem entirely reasonable and no explanation of the rate beyond the general nature of the department appears necessary.

RATE OF DEATH

The rate of death among members of the active service of the Supreme Court, First Department, Retirement Fund is lower than the corresponding rates in other city services with the exception of the teaching services, represented by the men and women under the Board of Education and the City College. In view of the nature of the service and the general type of the average member of the active service, the rate appears to be such a one as might have been anticipated for this service.

RATE OF DISABILITY

The rate of disability for the Supreme Court, First Department, Retirement Fund, is an adopted rate which, considered as a whole, ranks about seventh among the ten rates prepared. The only rates which are lower are those for clerks under the City of New York Employees' Retirement Fund, members of the Health Department Pension Fund, and men teachers in the Teachers' Retirement Fund. The rate of disability as shown increases rapidly from age 40 to 45 and after reaching the maximum between 45 and 55 begins slowly to decrease. This may be explained by the conditions of retirement, as persons above 55 years of age will ordinarily be retired as service pensioners.

RATE OF SERVICE RETIREMENT

The rate of service retirement is an adopted rate, slightly higher than the corresponding rate for men teachers and lower than similar rates for firemen, policemen, women teachers, and members of the Health Department and Supreme Court, Second Department, funds. This rate, although not very high, is believed to be a conservative rate for the valuation of the pension provisions.

RATE OF SALARY CHANGE

The rate of salary change in the Supreme Court, First Department, and in the Supreme Court, Second Department, were developed separately, but on comparison were found to resemble each other closely. The increases were about the same in extent and were similarly distributed according to the age of the employees. In view of this fact it was considered unnecessary to prepare separate scales for the two departments, consequently a single scale was prepared based on the combined data of the two funds.

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described

on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

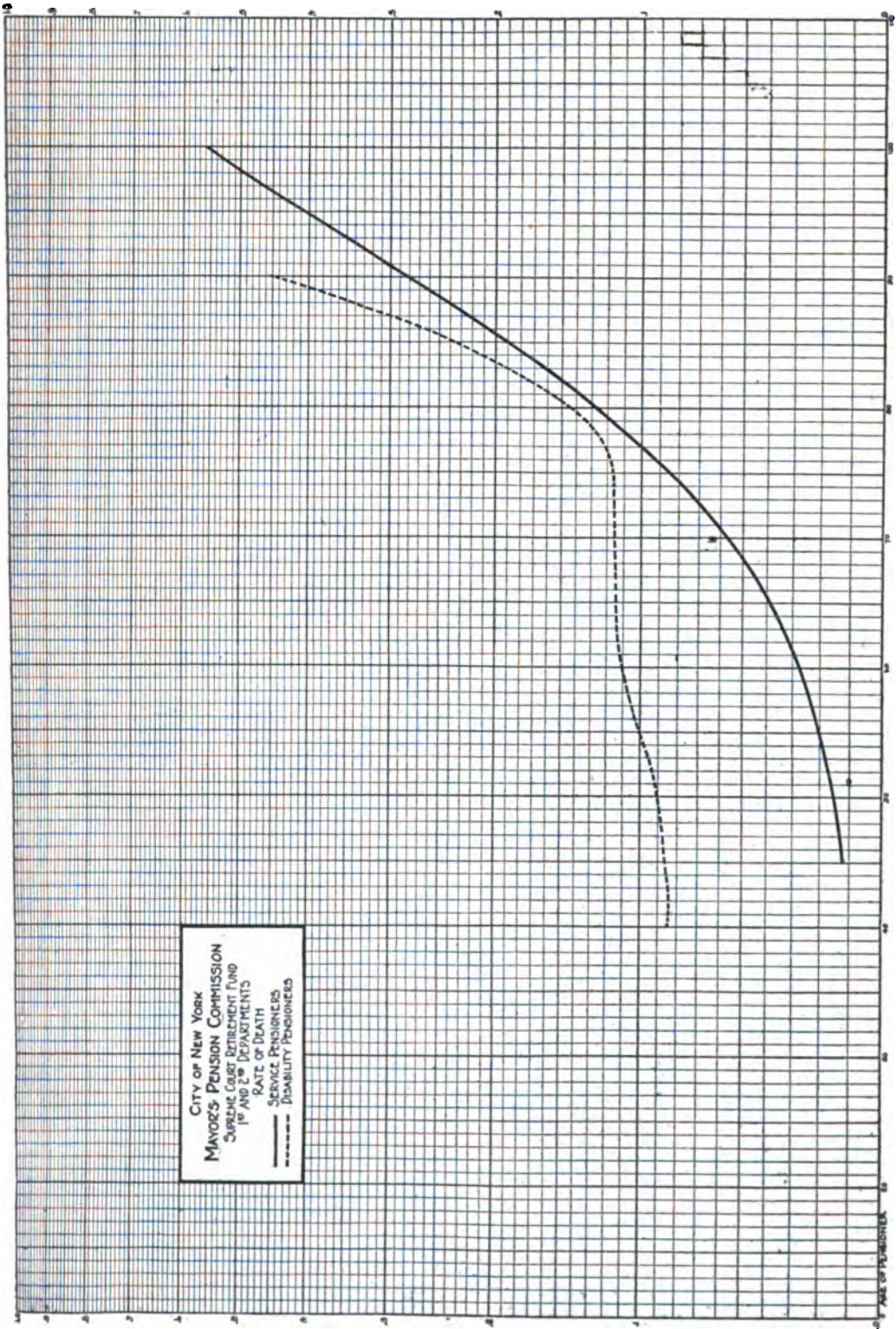
Pensioners

As no mortality table could be based on the insufficient experience of the pensioners of the Supreme Court, First Department, Retirement Fund, McClintock's annuitants' mortality rate for men was adopted for service pensioners, and Arthur Hunter's mortality rate among disabled lives was adopted for disability pensioners. The former rate has been adopted by the Insurance Department of New York as its standard, while the latter rate is often used by insurance companies in their valuations based on disabled lives. The following are McClintock's and Hunter's rates which were used in the valuation of the fund. A diagram showing the rates of mortality plotted on cross section paper is given on page 285.

TABLE 152—RATES OF MORTALITY AMONG PENSIONERS

Supreme Court, First Department, Retirement Fund

Age	Disability	Service	Age	Disability	Service
40	.0850	.0106	66	.1150	.0421
41	.0850	.0109	67	.1150	.0454
42	.0850	.0112	68	.1150	.0490
43	.0860	.0116	69	.1150	.0529
44	.0860	.0120	70	.1150	.0572
45	.0870	.0125	71	.1160	.0619
46	.0880	.0129	72	.1160	.0670
47	.0880	.0135	73	.1160	.0726
48	.0890	.0141	74	.1170	.0786
49	.0900	.0147	75	.1180	.0852
50	.0910	.0154	76	.1190	.0924
51	.0920	.0162	77	.1210	.1002
52	.0940	.0170	78	.1260	.1087
53	.0960	.0180	79	.1330	.1179
54	.0990	.0190	80	.1445	.1279
55	.1010	.0201	81	.1586	.1387
56	.1030	.0213	82	.1743	.1505
57	.1050	.0227	83	.1916	.1631
58	.1070	.0241	84	.2114	.1768
59	.1090	.0258	85	.2356	.1915
60	.1110	.0275	86	.2657	.2074
61	.1130	.0294	87	.3030	.2244
62	.1140	.0315	88	.3467	.2426
63	.1140	.0338	89	.3959	.2621
64	.1150	.0364	90	.4545	.2830
65	.1150	.0391	..	...	...



SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above:

TABLE 153—ACTIVE SERVICE TABLE AND SALARY SCALE

Supreme Court, First Department, Retirement Fund

Age	Living $l_x^{(a)}$	Withdrawals $w_x^{(a)}$	Deaths $d_x^{(a)}$	RETIREMENTS		Total Decrement	Salary Scale s_x	Age	Living $l_x^{(a)}$	Withdrawals $w_x^{(a)}$	Deaths $d_x^{(a)}$	RETIREMENTS		Total Decrement	Salary Scale s_x
				Disability $f_x^{(a)}$	Service $r_x^{(a)}$							Disability $f_x^{(a)}$	Service $r_x^{(a)}$		
20	1,000,000	40,200	3,100	...	...	43,300	1,365	56	418,336	297	5,083	3,606	8,283	17,269	2,300
21	950,700	35,015	3,109	...	...	38,124	1,432	57	401,067	220	5,086	3,401	8,823	17,539	2,200
22	918,576	30,405	3,123	...	...	33,528	1,500	58	383,528	161	5,097	3,172	9,473	17,903	2,280
23	885,048	26,728	3,160	...	...	29,888	1,575	59	365,025	110	5,079	2,925	9,908	18,022	2,270
24	855,160	23,346	3,173	...	...	26,519	1,646	60	347,603	63	5,072	2,658	10,463	18,256	2,260
25	828,641	20,550	3,215	...	...	23,765	1,719	61	329,347	23	5,039	2,372	10,967	18,401	2,255
26	804,876	18,270	3,236	...	...	21,506	1,789	62	310,946	...	5,022	2,077	11,443	18,542	2,240
27	783,370	16,216	3,282	...	...	19,408	1,854	63	292,404	...	4,986	1,754	11,696	18,436	2,235
28	763,872	14,384	3,323	...	...	17,707	1,920	64	273,968	...	4,945	1,389	12,027	18,361	2,225
29	746,165	12,797	3,373	...	...	16,170	1,978	65	255,607	...	4,908	1,015	12,192	18,115	2,220
30	729,995	11,424	3,424	...	...	14,848	2,035	66	237,492	...	4,868	689	12,326	17,883	2,210
31	715,147	10,177	3,490	...	...	13,667	2,090	67	219,609	...	4,831	477	12,320	17,628	2,200
32	701,480	9,133	3,536	...	...	12,669	2,140	68	201,981	...	4,837	335	12,301	17,463	2,190
33	688,811	8,238	3,596	...	...	11,834	2,185	69	184,518	...	4,797	336	12,160	17,193	2,180
34	676,977	7,393	3,662	...	...	11,055	2,225	70	167,325	...	4,769	167	11,880	16,816	2,170
35	665,922	6,633	3,736	...	...	10,369	2,265	71	150,509	...	4,741	110	11,589	16,440	2,165
36	655,553	5,966	3,802	...	...	9,768	2,295	72	134,060	...	4,692	71	11,128	15,891	2,160
37	645,785	5,341	3,875	...	...	9,216	2,320	73	118,178	...	4,550	45	10,577	15,172	2,150
38	636,569	4,762	3,959	...	...	8,721	2,340	74	103,006	...	4,388	24	9,940	14,352	2,140
39	627,848	4,238	4,043	...	...	8,281	2,350	75	88,654	...	4,189	11	9,220	13,420	2,130
40	619,567	3,748	4,139	...	...	8,166	2,360	76	75,234	...	3,950	...	8,464	12,414	2,120
41	611,401	3,320	4,219	1,113	...	8,052	2,365	77	62,820	...	3,638	...	7,633	11,261	2,110
42	602,749	2,917	4,304	2,170	...	7,901	2,370	78	51,559	...	3,274	...	6,754	10,028	2,085
43	593,358	2,540	4,415	2,925	...	7,880	2,375	79	41,531	...	2,888	...	5,898	8,786	2,070
44	583,478	2,217	4,481	3,402	175	7,802	2,375	80	32,745	...	2,497	...	5,052	7,549	2,060
45	573,203	1,937	4,546	3,726	802	7,710	2,375	81	25,196	...	2,104	...	4,220	6,324	2,040
46	562,192	1,674	4,616	3,992	1,462	7,614	2,370	82	18,872	...	1,727	...	3,453	5,180	2,025
47	550,448	1,459	4,684	4,134	2,092	7,500	2,365	83	13,692	...	1,369	...	2,752	4,121	2,010
48	538,079	1,254	4,751	4,231	2,690	7,366	2,360	84	9,571	...	1,048	...	2,130	3,178	1,989
49	525,133	1,098	4,815	4,206	3,466	7,215	2,355	85	6,393	...	763	...	1,592	2,355	1,970
50	511,458	936	4,859	4,301	4,092	7,064	2,350	86	4,038	...	522	...	1,151	1,945	1,955
51	497,270	796	4,918	4,277	4,777	6,914	2,340	87	2,365	...	331	...	708	1,120	1,930
52	482,406	675	4,964	4,107	5,451	6,766	2,335	88	1,236	...	187	...	525	712	1,905
53	467,110	561	4,998	4,087	6,166	6,612	2,330	89	524	...	85	...	300	304	1,885
54	451,307	465	5,034	3,953	6,845	6,465	2,320	90	130	...	23	...	167	140	1,860
55	435,042	372	5,055	3,780	7,463	6,310	2,310								

TABLE 154—DISABILITY PENSIONERS' MORTALITY TABLE
Supreme Court, First Department, Retirement Fund

Age	Living $l_z^{(d)}$	Dying $d_z^{(d)}$	Age	Living $l_z^{(d)}$	Dying $d_z^{(d)}$
40	1,712	146	66	117	13
41	1,566	133	67	104	12
42	1,433	122	68	92	11
43	1,311	113	69	81	9
44	1,198	103	70	72	8
45	1,095	95	71	64	7
46	1,000	88	72	57	7
47	912	80	73	50	6
48	832	74	74	44	5
49	758	68	75	39	5
50	690	63	76	34	4
51	627	58	77	30	4
52	569	53	78	26	3
53	516	50	79	23	3
54	466	46	80	20	3
55	420	42	81	17	3
56	378	39	82	14	2
57	339	36	83	12	2
58	303	32	84	10	2
59	271	30	85	8	2
60	241	27	86	6	2
61	214	24	87	4	1
62	190	22	88	3	1
63	168	19	89	2	1
64	149	17	90	1	1
65	132	15	..	....	....

TABLE 155—SERVICE PENSIONERS' MORTALITY TABLE
Supreme Court, First Department, Retirement Fund

Age	Living $l_z^{(p)}$	Dying $d_z^{(p)}$	Age	Living $l_z^{(p)}$	Dying $d_z^{(p)}$
40	776,753	8,206	73	311,480	22,600
41	768,547	8,358	74	288,880	22,710
42	760,189	8,526	75	266,170	22,682
43	751,663	8,710	76	243,488	22,498
44	742,953	8,913	77	220,990	22,145
45	734,040	9,135	78	198,845	21,613
46	724,905	9,378	79	177,232	20,898
47	715,527	9,641	80	156,334	19,995
48	705,886	9,927	81	136,339	18,914
49	695,959	10,238	82	117,425	17,666
50	685,721	10,572	83	99,759	16,271
51	675,149	10,934	84	83,488	14,759
52	664,215	11,320	85	68,729	13,162
53	652,895	11,736	86	55,567	11,523
54	641,159	12,179	87	44,044	9,882
55	628,980	12,649	88	34,162	8,289
56	616,331	13,150	89	25,873	6,782
57	603,181	13,677	90	19,091	5,402
58	589,504	14,231	91	13,689	4,177
59	575,273	14,812	92	9,512	3,125
60	560,461	15,415	93	6,387	2,258
61	545,046	16,040	94	4,129	1,568
62	529,006	16,681	95	2,561	1,043
63	512,325	17,335	96	1,518	661
64	494,990	17,995	97	857	400
65	476,995	18,654	98	457	227
66	458,341	19,305	99	230	122
67	439,036	19,936	100	108	60
68	419,100	20,537	101	48	29
69	398,563	21,095	102	19	12
70	377,468	21,597	103	7	5
71	355,871	22,026	104	2	1
72	333,845	22,365	105	1	1

PRESENT VALUES OF BENEFITS AND CONTRIBUTIONS

The present values of the benefits were developed from the preceding service and mortality tables. The following table shows the present value of total salary to be earned during active service on a basis of entrance salary of \$1,000, and the present value of a pension of final salary in terms of an entrance salary of \$1,000 upon event of the various conditions upon which pensions are payable, as given in the enumeration of benefits.

TABLE 156—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUES OF THE PENSION BENEFITS PAYABLE TO THESE MEMBERS BASED ON AN ENTRANCE SALARY OF \$1,000

Supreme Court, First Department, Retirement Fund

Age at Entrance	Total Future *Salary	Total of All Pension Benefits	PENSION TO MEMBERS	
			Upon Service Retirement	Upon Disability Retirement
20	\$21,333	\$556	\$422	\$134
25	19,567	617	490	127
30	17,576	638	548	90
35	15,943	649	595	54
40	14,866	653	628	25

*Total future salary estimated without use of *71*₂ column which was used to obtain cost of service pension only.

The expectations of life and the present values of a pension of one to pensioners are shown in the following tables:

TABLE 157—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY PENSIONERS

Supreme Court, First Department, Retirement Fund

Age	Annuity Value	Expectation of Life	Age	Annuity Value	Expectation of Life
40	7.49	10.26	65	5.99	7.55
41	7.45	10.17	66	5.94	7.45
42	7.40	10.07	67	5.87	7.32
43	7.34	9.96	68	5.81	7.21
44	7.29	9.85	69	5.77	7.12
45	7.22	9.73	70	5.67	6.94
46	7.16	9.61	71	5.55	6.75
47	7.09	9.48	72	5.40	6.52
48	7.01	9.35	73	5.31	6.36
49	6.93	9.21	74	5.17	6.16
50	6.85	9.07	75	4.99	5.88
51	6.77	8.93	76	4.84	5.68
52	6.68	8.79	77	4.64	5.37
53	6.59	8.64	78	4.46	5.12
54	6.52	8.52	79	4.14	4.72
55	6.44	8.39	80	3.86	4.35
56	6.37	8.27	81	3.61	4.03
57	6.30	8.16	82	3.45	3.79
58	6.25	8.07	83	3.09	3.33
59	6.19	7.97	84	2.72	2.90
60	6.15	7.90	85	2.33	2.50
61	6.12	7.83	86	1.98	2.17
62	6.08	7.76	87	1.96	2.00
63	6.07	7.71	88	1.40	1.50
64	6.03	7.63	89	1.00	1.00

**TABLE 158—ANNUITY VALUES AND EXPECTATIONS OF LIFE
APPLICABLE TO SERVICE PENSIONERS**

Supreme Court, First Department, Retirement Fund

Age	Annuity Value	Expectation of Life	Age	Annuity Value	Expectation of Life
40	15.80	28.08	70	7.24	9.18
41	15.58	27.37	71	6.93	8.71
42	15.36	26.67	72	6.63	8.25
43	15.13	25.96	73	6.34	7.81
44	14.89	25.26	74	6.04	7.38
45	14.65	24.56	75	5.76	6.97
46	14.40	23.87	76	5.48	6.57
47	14.15	23.17	77	5.20	6.19
48	13.89	22.48	78	4.94	5.82
49	13.62	21.80	79	4.68	5.47
50	13.35	21.11	80	4.43	5.13
51	13.07	20.44	81	4.18	4.81
52	12.79	19.76	82	3.95	4.50
53	12.50	19.10	83	3.72	4.21
54	12.21	18.44	84	3.50	3.94
55	11.91	17.79	85	3.29	3.68
56	11.62	17.14	86	3.09	3.43
57	11.31	16.50	87	2.90	3.19
58	11.01	15.88	88	2.71	2.97
59	10.70	15.26	89	2.54	2.77
60	10.38	14.65	90	2.37	2.57
61	10.07	14.05	91	2.22	2.39
62	9.75	13.46	92	2.07	2.22
63	9.44	12.88	93	1.93	2.06
64	9.12	12.31	94	1.80	1.91
65	8.80	11.76	95	1.67	1.77
66	8.49	11.22	96	1.56	1.64
67	8.17	10.69	97	1.45	1.52
68	7.86	10.17	98	1.35	1.41
69	7.55	9.67	99	1.25	1.30

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number and salaries of employees, by age and length of service, and the number and pensions of pensioners by age on the roll as of June 30, 1914:

TABLE 159—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS, SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Supreme Court, First Department, Retirement Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
23	1	\$1,800	294	\$673,550	53	6	\$14,400	114	\$259,300
24	..	...	293	671,750	54	7	16,900	108	244,900
25	1	1,400	293	671,750	55	15	27,200	101	228,000
26	1	1,800	292	670,350	56	8	20,500	86	200,800
27	1	1,800	291	668,550	57	9	26,400	78	180,300
28	6	11,400	290	666,750	58	9	17,300	69	153,900
29	1	1,500	284	655,350	59	8	16,600	60	136,600
30	3	6,100	283	653,850	60	2	5,800	52	120,000
31	3	7,800	280	647,750	61	5	12,300	50	114,200
32	6	13,300	277	639,950	62	6	13,200	45	101,900
33	5	11,500	271	626,650	63	..	...	39	88,700
34	10	20,800	266	615,150	64	5	10,900	39	88,700
35	8	19,200	256	594,350	65	2	3,600	34	77,800
36	3	8,600	248	575,150	66	6	13,900	32	74,200
37	3	6,800	245	566,550	67	7	14,700	26	60,300
38	2	6,100	242	559,750	68	3	6,500	19	45,600
39	8	19,000	240	553,650	69	2	5,800	16	39,100
40	7	17,700	232	534,650	70	4	9,300	14	33,300
41	8	22,200	225	516,950	71	2	5,800	10	24,000
42	10	22,700	217	494,750	72	1	2,500	8	18,200
43	10	22,000	207	472,050	73	1	2,500	7	15,700
44	9	26,550	197	450,050	74	1	3,500	6	13,200
45	9	20,900	188	423,500	75	1	1,800	5	9,700
46	9	21,800	179	402,600	76	1	2,500	4	7,900
47	7	16,900	170	380,800	77	1	1,800	3	5,400
48	9	19,100	163	363,900	78-83	..	...	2	3,600
49	11	21,200	154	344,800	84	1	1,800	2	3,600
50	6	14,200	143	323,600	85	..	...	1	1,800
51	14	31,600	137	309,400	86	1	1,800	1	1,800
52	9	18,500	123	277,800	..	..	...	...	...

TABLE 160—NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Supreme Court, First Department, Retirement Fund

Total Service—Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service—Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	1	\$1,800	294	\$673,550	16	18	\$38,000	147	\$342,100
1	7	14,400	293	671,750	17	8	16,200	129	304,100
2	10	20,200	286	657,350	18	13	32,800	121	287,900
3	5	9,200	276	637,150	19	17	38,300	108	255,100
4	11	22,600	271	627,950	20	12	27,800	91	216,800
5	5	11,100	260	605,350	21	7	16,500	79	189,000
6	4	9,700	255	594,250	22	10	23,800	72	172,500
7	31	78,500	251	584,550	23	5	9,900	62	148,700
8	12	22,300	220	506,050	24	11	23,800	57	138,800
9	11	28,400	208	483,750	25	9	20,500	46	115,000
10	10	20,300	197	455,350	26	3	7,900	37	94,500
11	7	18,200	187	435,050	27	4	6,300	34	86,600
12	12	25,100	180	416,850	28	6	14,400	30	80,300
13	6	15,700	168	391,750	29	2	4,800	24	65,900
14	10	21,700	162	376,050	30 & over	22	61,100	22	61,100
15	5	12,250	152	354,350					

TABLE 161—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Supreme Court, First Department, Pension Fund

Age	Number	Pensions	Age	Number	Pensions
50	1	\$2,000	74	1	\$750
55	1	600	79	1	900
59	1	2,000	83	1	750
67	2	2,150	Total	9	\$10,230
69	1	1,080			

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets as of June 30, 1914, and shows the complete financial condition of the fund

TABLE 162—A VALUATION OF ASSETS AND LIABILITIES OF FUND—VALUED AS

LIABILITIES	
Item	Present Value of Payments to be Made
Pensions to 9 Pensioners now on the pension roll of the fund as follows:	
Annual pensions aggregating \$10,230	\$58,720
Total Pensions Entered Upon	\$58,720
Pensions to such Employees as will retire from the present active force of 294 employees:	
Service Pensions	\$798,885
Disability Pensions	80,258
Total Pensions not Entered Upon	\$879,143
Grand Total	\$937,863

and liabilities of the Supreme Court, First Department, Retirement Fund,
as of that date:

**THE SUPREME COURT, FIRST DEPARTMENT, RETIREMENT
OF JUNE 30, 1914**

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand	\$5,974
Contribution of One Percentum of Future Salaries by Employees	73,176
*Deficiency.....	858,713
Grand Total	\$937,863

*NOTE—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$36,600.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 163—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Supreme Court, First Department, Retirement Fund

Year After Valuation	*Date	Disability Pensions	Year After Valuation	*Date	Disability Pensions
0	1914	\$9,602	22	1936	\$338
1	1915	8,483	23	1937	275
2	1916	7,459	24	1938	231
3	1917	6,539	25	1939	197
4	1918	5,733	26	1940	165
5	1919	5,024	27	1941	135
6	1920	4,361	28	1942	112
7	1921	3,753	29	1943	93
8	1922	3,250	30	1944	74
9	1923	2,838	31	1945	55
10	1924	2,463	32	1946	42
11	1925	2,124	33	1947	35
12	1926	1,830	34	1948	28
13	1927	1,584	35	1949	21
14	1928	1,364	36	1950	14
15	1929	1,171	37	1951	10
16	1930	998	38	1952	7
17	1931	844	39	1953	4
18	1932	711	40	1954	1
19	1933	594	..	....	...
20	1934	497	Total.		\$73,472
21	1935	413			

*Date Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Supreme Court, First Department, expressed as a percentage of the employee's salary:

TABLE 164—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Age at Entrance	Total	Service Pension (1)	Disability Pension (2)	Age at Entrance	Total	Service Pension (1)	Disability Pension (2)
20	2.61	1.98	.63	31	3.80	3.31	.49
21	2.73	2.08	.65	32	3.91	3.45	.46
22	2.85	2.18	.67	33	4.02	3.60	.42
23	2.96	2.29	.67	34	4.13	3.74	.39
24	3.07	2.40	.67	35	4.23	3.88	.35
25	3.17	2.52	.65	36	4.34	4.02	.32
26	3.27	2.64	.63	37	4.45	4.16	.29
27	3.37	2.77	.60	38	4.55	4.30	.25
28	3.48	2.90	.58	39	4.64	4.42	.22
29	3.58	3.03	.55	40	4.73	4.54	.19
30	3.69	3.17	.52	..	...	...	...

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Supreme Court, Second Department, Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

Upon disability after 25 years' service, a pension of not more than one-half of average of last two years' salary.

Because of a lack of sufficient experience the average allowance used was 50 per cent. of average of last two years' salary.

Contributions

BY EMPLOYEES

No contribution.

BY CITY

Indirect contributions:

None provided.

Direct contributions:

Budgetary appropriations to cover maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of retirement

Rate of change of salary

Rate of death among pensioners.

BASIC DATA AND THEIR DEVELOPMENT

In the valuation were included schedules for all employees of the Supreme Court, Second Department, except the judges, who are carried under the valuation of pensions for elected employees and the employees in the Appellate Division, who are paid exclusively by the State. The reason for the exclusion of these employees will be taken up in the discussion of the valuation balance sheet presented later.

The experience used as a basis for the rates has been described on page 279, in connection with the Supreme Court, First Department, Retirement Fund. As the experience of the two funds was combined no summary tables are shown here.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates which were used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, a diagram is given on page 282, showing the rates plotted on cross section paper.

TABLE 165—RATES OF SEPARATION FROM ACTIVE SERVICE

Supreme Court, Second Department, Retirement Fund

Age	Rate of Withdrawal	Rate of Death	Rate of Retirement	Age	Rate of Withdrawal	Rate of Death	Rate of Retirement
	${}^w q_x^{(a)}$	${}^d q_x^{(a)}$	${}^r q_x^{(a)}$		${}^w q_x^{(a)}$	${}^d q_x^{(a)}$	${}^r q_x^{(a)}$
20	.0402	.0031	...	56	.0007	.0122	.0284
21	.0366	.0033	...	57	.0006	.0127	.0305
22	.0331	.0034	...	58	.0004	.0133	.0330
23	.0302	.0036	...	59	.0003	.0139	.0351
24	.0273	.0037	...	60	.0002	.0146	.0378
25	.0248	.0039	...	61	.0001	.0153	.0405
26	.0227	.0040	...	62	...	.0162	.0435
27	.0207	.0042	...	63	...	.0171	.0460
28	.0188	.0044	...	64	...	.0181	.0490
29	.0172	.0045	...	65	...	.0192	.0517
30	.0157	.0047	...	66	...	.0205	.0548
31	.0142	.0049	...	67	...	.0220	.0583
32	.0130	.0050	...	68	...	.0239	.0626
33	.0120	.0052	...	69	...	.0260	.0672
34	.0109	.0054	...	70	...	.0285	.0720
35	.0100	.0056	...	71	...	.0315	.0777
36	.0091	.0058	...	72	...	.0350	.0835
37	.0083	.0060	...	73	...	.0385	.0899
38	.0075	.0062	...	74	...	.0426	.0967
39	.0068	.0064	...	75	...	.0473	.1041
40	.0061	.0067	.0005	76	...	.0525	.1125
41	.0054	.0069	.0018	77	...	.0578	.1215
42	.0048	.0071	.0036	78	...	.0635	.1310
43	.0043	.0074	.0049	79	...	.0696	.1420
44	.0038	.0077	.0061	80	...	.0763	.1543
45	.0034	.0079	.0079	81	...	.0835	.1675
46	.0030	.0082	.0097	82	...	.0915	.1830
47	.0027	.0085	.0113	83	...	.1000	.2010
48	.0023	.0088	.0129	84	...	.1095	.2225
49	.0021	.0092	.0148	85	...	.1193	.2490
50	.0018	.0095	.0164	86	...	.1293	.2850
51	.0016	.0099	.0184	87	...	.1399	.3375
52	.0014	.0103	.0200	88	...	.1510	.4250
53	.0012	.0107	.0220	89	...	.1623	.5900
54	.0010	.0112	.0239	90	...	.1735	.8265
55	.0009	.0116	.0259	..	...	...	...

RATE OF RESIGNATION AND DISMISSAL

The same rate of withdrawal was used for this department as was employed in the pension fund for the Supreme Court, First Department.

RATE OF DEATH

The rate of death among members of the active service of the Supreme Court, Second Department, Retirement Fund is the same as that used for the Supreme Court, First Department.

RATE OF DISABILITY

Since in the Supreme Court, Second Department, no pension is allowable on disability, if the disability occurs within the first twenty-five years of service, the disability rate prepared for use in the valuation of the funds in the Supreme Court, First Department, was not needed here. All retirements after twenty-five years of service were considered as service retirements even though they were occasioned by disability.

RATE OF SERVICE RETIREMENT

The rate of service retirement for the Supreme Court, Second Department, was made by combining into a single rate the rate of disability retirement and the rate of service retirement as used for the Supreme Court, First Department, on the assumption that the same proportion of employees, after they had reached the age of eligibility, would retire in the Supreme Court, Second Department, as in the Supreme Court, First Department. The retirements under the Second Department fund are, of course, technically, disability retirements, as no legal provision is made for service retirement, but since only one type of pension is provided it has been considered for comparative purposes a service pension.

RATE OF SALARY CHANGE

The rate of salary change used for this department is the same as that employed in the valuation of funds, as explained on page 279, for the Supreme Court, First Department, Retirement Fund.

Pensioners

The rate of death adopted was the same as that selected for the Supreme Court, First Department. This rate is shown in the table on page 284.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following table is based on the rates discussed above. The mortality table for pensioners is the same as that adopted for the disability pensioners of the Supreme Court, First Department, and is shown on page 287.

TABLE 166—ACTIVE SERVICE TABLE AND SALARY SCALE

Supreme Court, Second Department, Retirement Fund

Age	Living $l(a)$ \$	Withdrawals $w(a)$ \$	Deaths $d(a)$ \$	Service Retirements $r(a)$ \$	Total Decrement	Salary Scale s_a	Age	Living $l(a)$ \$	Withdrawals $w(a)$ \$	Deaths $d(a)$ \$	Service Retirements $r(a)$ \$	Total Decrement	Salary Scale s_a
20	1,000,000	40,200	3,100	...	43,300	1,365	56	418,336	297	5,083	11,889	17,869	2,300
21	956,700	35,015	3,109	...	38,124	1,432	57	401,067	229	5,086	12,224	17,539	2,290
22	918,576	30,405	3,123	...	33,528	1,500	58	383,528	161	5,097	12,645	17,003	2,280
23	885,048	26,728	3,160	...	29,888	1,575	59	365,025	110	5,079	12,833	16,022	2,270
24	855,160	23,346	3,173	...	26,519	1,646	60	347,603	63	5,072	13,121	18,256	2,260
25	828,641	20,550	3,215	...	23,765	1,719	61	329,347	23	5,039	13,339	18,401	2,255
26	804,876	18,270	3,236	...	21,506	1,789	62	310,946	...	5,022	13,520	18,542	2,240
27	783,370	16,216	3,282	...	19,498	1,854	63	292,404	...	4,986	13,450	18,436	2,235
28	763,872	14,384	3,323	...	17,707	1,920	64	273,968	...	4,945	13,416	18,301	2,225
29	746,165	12,797	3,373	...	16,170	1,978	65	255,067	...	4,908	13,207	18,115	2,220
30	729,995	11,424	3,424	...	14,848	2,035	66	237,492	...	4,868	13,015	17,883	2,210
31	715,147	10,177	3,490	...	13,667	2,090	67	219,069	...	4,831	12,797	17,628	2,200
32	701,480	9,133	3,536	...	12,669	2,140	68	201,981	...	4,827	12,636	17,463	2,190
33	688,811	8,338	3,596	...	11,834	2,185	69	184,518	...	4,797	12,396	17,193	2,180
34	676,977	7,393	3,662	...	11,055	2,225	70	167,325	...	4,769	12,047	16,816	2,170
35	665,922	6,633	3,736	...	10,369	2,265	71	150,509	...	4,741	11,690	16,440	2,165
36	655,553	5,966	3,802	...	9,768	2,295	72	134,060	...	4,692	11,199	15,891	2,160
37	645,785	5,341	3,875	...	9,216	2,320	73	118,178	...	4,550	10,622	15,172	2,150
38	636,569	4,762	3,959	...	8,721	2,340	74	103,006	...	4,388	9,964	14,352	2,140
39	627,848	4,238	4,043	...	8,281	2,350	75	88,654	...	4,189	9,231	13,420	2,130
40	619,567	3,748	4,139	279	8,166	2,360	76	75,234	...	3,950	8,404	12,414	2,120
41	611,401	3,350	4,210	1,113	8,652	2,365	77	62,820	...	3,628	7,633	11,261	2,110
42	602,749	2,917	4,304	2,170	9,391	2,370	78	51,559	...	3,274	6,754	10,028	2,085
43	593,358	2,540	4,415	3,577	9,880	2,375	79	41,531	...	2,888	5,898	8,786	2,070
44	583,478	2,217	4,481	4,528	10,275	2,375	80	32,745	...	2,497	5,052	7,549	2,060
45	573,203	1,937	4,546	5,454	11,011	2,375	81	25,196	...	2,104	4,220	6,324	2,040
46	562,192	1,674	4,616	6,226	11,744	2,370	82	18,872	...	1,727	3,453	5,180	2,025
47	550,448	1,459	4,684	6,941	12,360	2,365	83	13,692	...	1,360	2,752	4,221	2,010
48	538,079	1,254	4,751	7,602	12,946	2,360	84	9,571	...	1,048	2,130	3,178	1,989
49	525,133	1,068	4,815	8,393	13,675	2,355	85	6,393	...	763	1,592	2,355	1,970
50	511,458	936	4,859	9,150	14,188	2,350	86	4,038	...	522	1,151	1,673	1,945
51	497,270	796	4,918	9,648	14,864	2,340	87	2,365	...	324	798	1,129	1,920
52	482,406	675	4,964	10,233	15,287	2,335	88	1,236	...	187	525	712	1,895
53	467,119	561	4,998	10,768	15,812	2,330	89	524	...	85	309	394	1,865
54	451,307	465	5,032	11,272	16,265	2,320	90	130	...	23	107	130	1,840
55	435,042	379	5,055	...	16,706	2,310	...	...	...	...	...	...	...

*Although these retirements are technically on account of disability they were considered service retirements on account of the service limitation.

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The present value of the benefit was developed from the preceding service and mortality table. The following table shows the present value of total salary to be earned during active service on a basis of an assumed salary of \$1,000, and the present value of a pension of final salary in terms of an assumed entrance salary of \$1,000 upon event of the condition upon which pension is payable, as given in the enumeration of benefits and contributions.

TABLE 167—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUE OF THE PENSION BENEFIT PAYABLE TO THESE MEMBERS BASED ON AN ENTRANCE SALARY OF \$1000

Supreme Court, Second Department, Retirement Fund

Age at Entrance	Total Future Salary	Pension to Members Upon Retirement	Age at Entrance	Total Future Salary	Pension to Members Upon Retirement
20	\$21,333	\$397	35	\$15,043	\$501
25	19,567	446	40	14,866	524
30	17,576	477	..	...	...

The expectation of life and the present value of a pension of one to pensioners is shown on page 288.

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service as of June 30, 1914. No table for pensioners is presented as there is but one pensioner. His pension amounts to \$900 per annum.

TABLE 168—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Supreme Court, Second Department, Retirement Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
26	1	\$2,750	138	\$322,400	53	..	...	43	\$104,400
27	1	1,500	137	319,650	54	5	\$16,400	43	104,400
28	..	...	136	318,150	55	2	6,100	38	88,000
29	..	...	136	318,150	56	..	...	36	81,900
30	1	1,500	136	318,150	57	2	3,500	36	81,900
31	1	1,800	135	316,650	58	1	3,000	34	78,400
32	4	11,750	134	314,850	59	..	...	33	75,400
33	4	7,000	130	303,100	60	1	1,600	33	75,400
34	5	9,500	126	296,100	61	1	3,600	32	73,800
35	5	10,250	121	286,600	62	4	10,800	31	70,200
36	7	15,800	116	276,350	63	1	3,600	27	59,400
37	6	16,000	109	260,550	64	1	2,000	26	55,800
38	6	14,500	103	244,550	65	..	...	25	53,800
39	4	11,100	97	230,050	66	2	3,300	25	53,800
40	7	13,300	93	218,950	67	5	8,900	23	50,500
41	5	11,000	86	205,650	68	2	3,500	18	41,600
42	3	5,800	81	194,650	69	2	5,600	16	38,100
43	1	1,800	78	188,850	70	2	4,300	14	32,500
44	4	10,500	77	187,050	71	5	10,800	12	28,200
45	1	1,500	73	176,550	72	1	3,600	7	17,400
46	9	22,600	72	175,050	73	..	...	6	13,800
47	6	14,050	63	152,450	74	2	5,000	6	13,800
48	3	6,500	57	138,400	75	..	...	4	8,800
49	3	9,000	54	131,900	76	2	3,800	4	8,800
50	..	...	51	122,900	77	1	2,000	2	5,000
51	7	16,000	51	122,900	78	..	...	1	3,000
52	1	2,500	44	106,900	79	1	3,000	1	3,000

TABLE 169—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Supreme Court, Second Department, Retirement Fund

Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	7	\$12,000	138	\$322,400	16	3	\$6,500	23	\$60,400
1	9	19,400	131	310,400	17	1	1,600	20	53,900
2	24	46,750	122	291,000	18	3	10,600	19	52,300
3	8	16,450	98	244,250	19	4	8,300	16	41,700
4	3	8,600	90	227,800	20	1	3,000	12	33,400
5	7	12,900	87	219,200	21	1	5,000	11	30,400
6	2	5,750	80	206,300	22	1	3,000	10	25,400
7	32	77,500	78	200,550	23	4	7,400	9	22,400
8	1	1,800	46	123,050	24	..	....	5	15,000
9	4	11,200	45	121,250	25	..	....	5	15,000
10	2	4,750	41	110,050	26	1	1,800	5	15,000
11	2	6,000	39	105,300	27	..	....	4	13,200
12	1	2,000	37	99,300	28	..	....	4	13,200
13	2	4,800	36	97,300	29	..	....	4	13,200
14	1	3,000	34	92,500	30 & over	4	13,200	4	13,200
15	10	29,100	33	89,500					

VALUATION BALANCE SHEET

The law establishing the pension system of the Supreme Court, Second Department, Retirement Fund provides that the pensions shall be paid from the same source as that from which the salaries were paid during active service. The salaries are paid partly by the state and partly by the city, the total amounts being apportioned between the counties within the jurisdiction covered by the court according to their taxable valuation. The city pays the amounts chargeable against the counties within its limits.

When the schedules for the department were collected it was decided to value the pensions of all persons paid wholly or partly by the city and then to apportion the liability on the same basis on which the salaries are apportioned in order to obtain the total liability for pensions of the city. At the time the census for employees was taken the employees in the Appellate Division of the Supreme Court pension fund omitted to prepare cards on the theory that they received their entire salaries from the state and therefore would not be covered in the investigation of the city. No data for these employees could therefore be included, but the cards for the others were used. Of the total amount expended for salaries in the Supreme Court, Second Department, for the year ending December 31, 1914, about 86% were for the divisions intended in the valuation. Of the total salaries paid in that year about 95% were borne by the city and since this apportionment was based on the taxable valuations of the relative counties, it was deemed a proper basis for apportioning the liability. The following balance sheet, therefore, gives the entire liability for pensions as regards the employees considered and the estimated total liability which may be chargeable against the city as of June 30, 1914. The later figure was obtained by the use of the factor $\frac{95}{86}$, which represents the combination of the ratios previously mentioned.

TABLE 170—A VALUATION OF ASSETS AND LIABILITIES OF
FUND—VALUED AS

LIABILITIES		
ITEM	PRESENT VALUE OF PAYMENTS TO BE MADE	
	To Members Included in Tabulation	To All Mem- bers Who Re- ceive Salaries Paid by City
Pension of \$900 to one Pensioner now on the pension roll of the fund	\$4,357	\$4,357
Total Pensions Entered Upon.....	\$4,357	\$4,357
Pensions to such Employees as will retire from the present active force of 138 employees.....	\$234,712	\$259,275
Total Pensions not Entered Upon.....	\$234,712	\$259,275
Grand Total.....	\$239,069	\$263,632

**THE SUPREME COURT, SECOND DEPARTMENT, RETIREMENT
OF JUNE 30, 1914**

ASSETS		
ITEM	PRESENT VALUE OF PAYMENTS TO BE RECEIVED	
	To Members Included in Tabulation	To All Mem- bers Who Re- ceive Salaries Paid by City
Funds in hand.....	...	...
Contribution by Employees.....	...	...
Deficiency.....	\$239,069	\$263,632
Grand Total.....	\$239,069	\$263,632

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death. This table is based on the mortality table of pensioners and does not take into account the interest factor, which does not affect the appropriation if the amounts to pay pensions are appropriated as the pensions become payable.

TABLE 171—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Supreme Court, Second Department, Retirement Fund

Year After Valuation	*Date	Pensions	Year After Valuation	*Date	Pensions
0	1914	\$843	9	1923	\$183
1	1915	737	10	1924	130
2	1916	645	11	1925	92
3	1917	566	12	1926	65
4	1918	486	13	1927	39
5	1919	407	14	1928	12
6	1920	342	..	...	...
7	1921	289	Total		\$5,072
8	1922	236			

*Date Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Supreme Court, Second Department, Retirement Fund, expressed as a percentage of the employee's salary.

TABLE 172—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE PENSION BENEFIT OF THE SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND.

Age at Entrance	Total Pension	Age at Entrance	Total Pension	Age at Entrance	Total Pension
20	1.87	27	2.45	34	3.06
21	1.94	28	2.54	35	3.14
22	2.02	29	2.63	36	3.23
23	2.11	30	2.71	37	3.31
24	2.19	31	2.80	38	3.39
25	2.28	32	2.89	39	3.46
26	2.37	33	2.97	40	3.53

SECTION III

**STATISTICS OF FAMILY HISTORY, WITH AN EXPLANATION
OF THE DEVELOPMENT OF THE MONETARY VALUES
REQUIRED IN ESTIMATING THE COST OF
PENSIONS FOR DEPENDENTS**

STATISTICS OF FAMILY HISTORY, WITH AN EXPLANATION OF THE DEVELOPMENT OF THE MONETARY VALUES REQUIRED IN ESTIMATING THE COST OF PEN- SIONS FOR DEPENDENTS

Four pension funds—namely, the Police Pension Fund, the Fire Department Relief Fund, the Health Department Pension Fund and the Department of Street Cleaning Relief and Pension Fund, provide benefits for dependents; that is, for widows, children under eighteen, and dependent parents. The value of these benefits to dependents has, of course, been stated in the special sections of this report that deal with these four funds, and has been considered in determining their condition; but in the discussion of the separate funds no description has been given of the methods employed in making the valuation of benefits to dependents. For two reasons it seemed best to reserve this subject for consideration in a distinct section.

For each of the four funds the data were originally developed separately, but on comparison all were found to be essentially alike. All the data were therefore combined and used as the basis for a single set of primary tables which were considered applicable to each of the four funds. A single description, therefore, suffices for all.

Such an arrangement, moreover, will probably serve to make the report more convenient. Persons who are interested simply in the condition of the specific funds and do not care to go into the subject of the methods of valuing benefits to dependents need not be concerned at all with the present sections, since the results have been given in the sections devoted to the separate funds; but persons interested in the valuation of funds with such benefits will doubtless prefer to have the whole subject treated in one place, as the results have a value beyond their immediate use in this report. Data which can be used as a basis for valuing benefits of this character have been very limited. In fact the Commission, in its study of municipal and industrial pension funds in this country, was unable to locate a single source from which such data could be obtained in a form suitable for use in a valuation. Actuaries in this country have used data compiled abroad. Tables based on the population of New Zealand and others prepared by the Actuarial Committee which devised the proposed superannuation scheme for the Municipal and Shire Services of New South Wales are among the principal ones available. The present report makes available some American data and consequently it has seemed advisable to treat the subject somewhat broadly, so that those who may have occasion to use the figures may know precisely how they have been derived.

In the following discussion the data used as a basis in determining the ages and probable number of dependents left by an employee are taken up first; then the basis for determining the mortality experienced by such dependents is given, and finally a description of the formulæ or general methods employed in using the tables in the valuation of the pension benefits.

DESCRIPTION OF DATA—IN GENERAL

Although the facts regarding the family history of the employees were collected in each branch of the city government, they were only tabulated for those departments where pensions were allowed to dependents, as the Commission did not feel justified, at the time, in tabulating data which were not essential to its work. Moreover, if tables had been based on all the data collected and had varied materially from those based on the data for the four funds, they could not have been employed for the valuations required. As the family history data tabulated showed little correlation with the occupations of the employee, it seemed improbable that the development of the other data would have furnished any important additional evidence to guide the Commission in deciding whether to combine the data for the four departments in making the required valuations.

The number of persons considered in deriving the tables for this section of the report is given in the following summary statement:

TABLE 173—NUMBER OF PERSONS, EMPLOYEES AND MEMBERS OF THEIR FAMILIES, INCLUDED IN THE TABULATIONS OF FAMILY DATA

Class	Number
Employees:	
Single Men.....	4,808
Husbands, With Children.....	13,136
Without Children.....	2,916
Not Reporting.....	324
Total.....	16,376
Widowers or Divorcees, With Children.....	737
Without Children.....	172
Not Reporting.....	59
Total.....	968
Total.....	22,152
Dependents:	
Adults:	
Wives, Reporting Age.....	16,081
Not Reporting Age.....	295
Total.....	16,376
Widows, Pensions in Force.....	2,113
Pensions Terminated.....	405
Total.....	2,518
Parents.....	29
Children:	
Not Pensioned.....	42,413
Now on Pension.....	183
Pensions Terminated.....	236
Total.....	42,832
Total.....	83,907

MARITAL CONDITION OF EMPLOYEES

The following tabulation shows all the employees considered, classified by marital condition. Attention is called to the fact that no distinction was made between the first and subsequent marriages. Such refinements are not required for valuations under the present laws and the returns on the schedules do not afford the proper basis for such tables.

TABLE 174—TABULATION OF MARITAL CONDITION OF EMPLOYEES

Police, Fire, Health and Street Cleaning Department Funds Combined

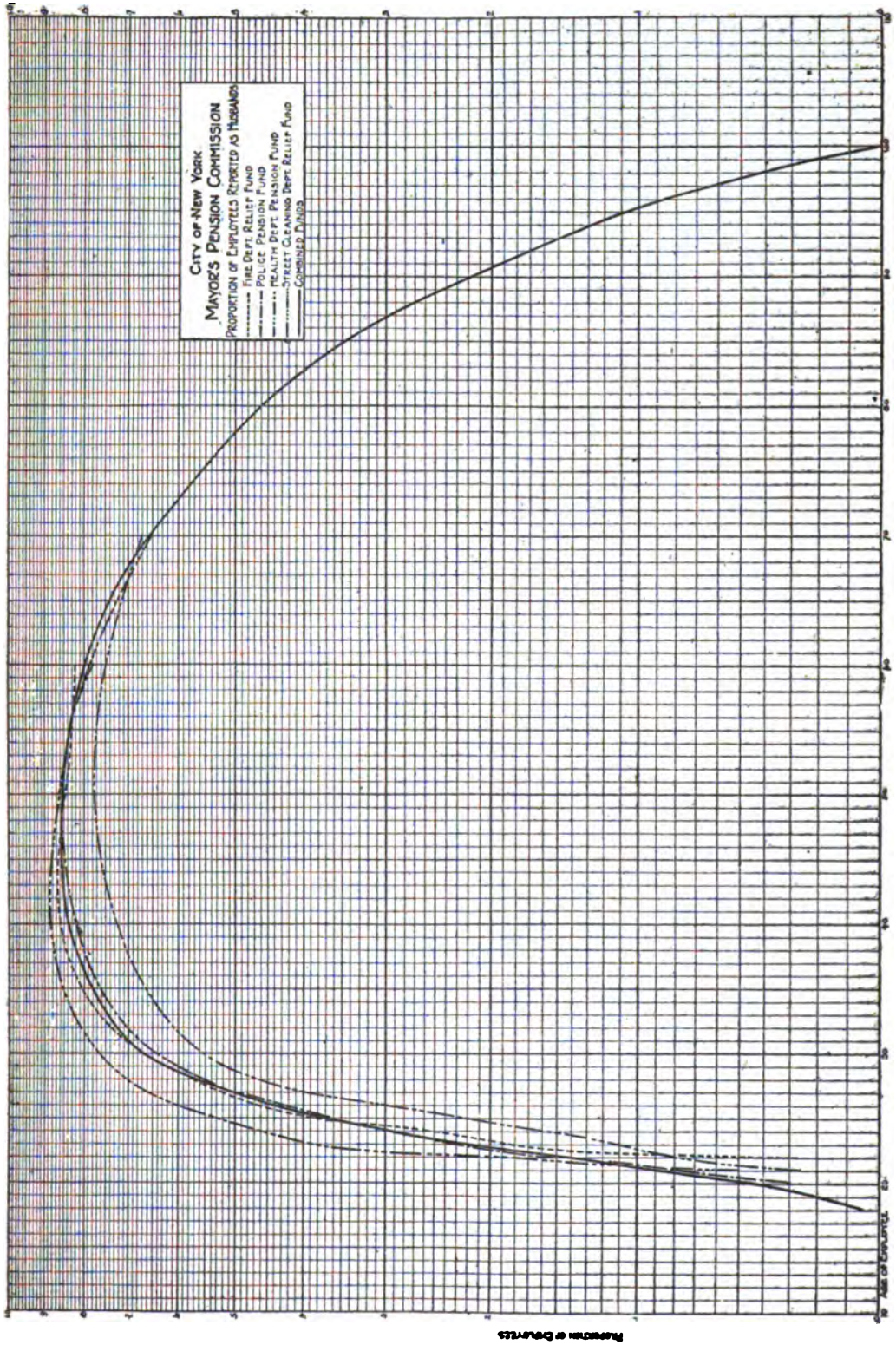
AGE	Total Number	Single Men	MARRIED MEN		AGE	Total Number	Single Men	MARRIED MEN	
			Hus-bands	Widowed or Divorced				Hus-bands	Widowed or Divorced
15	1	1	...	..	53	319	20	265	34
16	9	9	...	..	54	371	28	301	42
17	10	10	...	..	55	303	20	247	36
18	5	5	...	..	56	219	6	193	20
19	13	13	...	..	57	175	4	144	27
20	18	18	...	..	58	144	8	113	23
21	21	21	...	..	59	124	4	92	28
22	70	61	9	..	60	117	4	97	16
23	284	216	68	..	61	88	3	64	21
24	468	333	131	4	62	68	3	58	7
25	554	324	225	5	63	55	2	44	9
26	540	289	248	3	64	56	2	44	10
27	626	310	313	3	65	36	..	25	11
28	713	296	413	4	66	38	..	30	8
29	899	326	565	8	67	22	..	15	7
30	1,013	309	687	17	68	16	..	12	4
31	929	265	651	13	69	14	1	8	5
32	950	241	688	21	70	10	..	8	2
33	870	213	637	20	71	8	..	5	3
34	903	187	689	27	72	9	..	1	8
35	917	171	724	22	73	4	..	3	1
36	907	148	734	25	74	5	..	4	1
37	846	118	711	17	75	1	..	1	..
38	876	133	713	30	76	1	..	..	1
39	766	97	640	29	77	1	..	..	1
40	721	91	596	34	78	..	..	..	..
41	636	56	547	33	79	1	..	1	..
42	678	81	568	29	80	1	..	..	1
43	525	41	455	29	81	1	..	..	1
44	623	68	533	22	82	1	..	1	..
45	590	51	506	33	83	..	..	..	..
46	530	42	456	32	84	..	..	..	..
47	499	45	419	35	85	..	..	..	..
48	403	29	343	31	86	..	..	..	..
49	355	28	298	29	87	..	..	..	..
50	407	22	360	25	88	..	..	..	..
51	397	23	347	27					
52	372	12	326	34					
Totals					22,152	4,808	16,376	968	

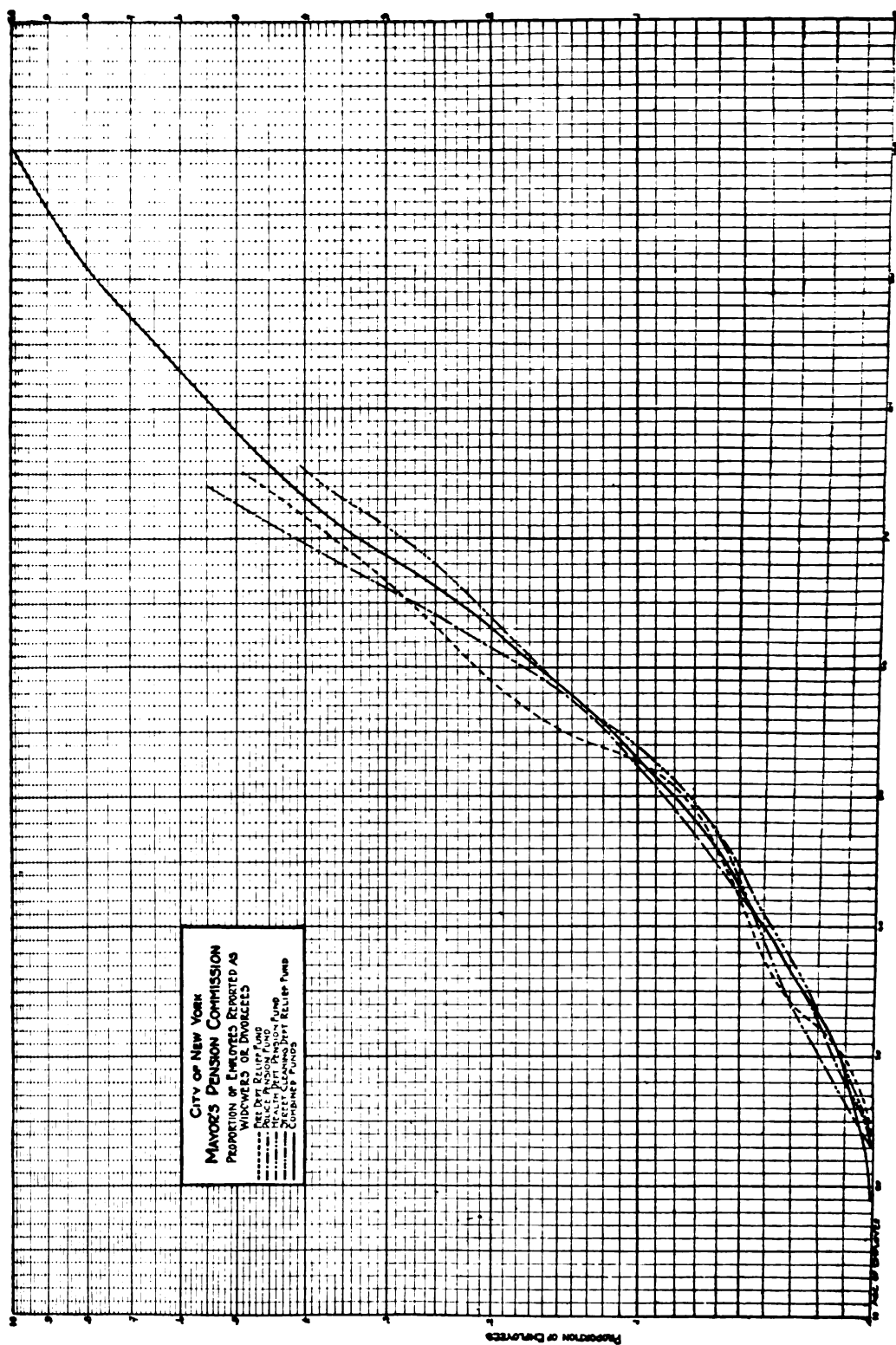
To value pensions to widows and children by the methods used in this report it is necessary to know the probable number of employees who will die as husbands and the probable number who will die as widowers or divorcees. If it be assumed that the distribution according to marital condition is the same for persons dying as for the living at corresponding ages, a conservative assumption which is customary in valuations of this kind because of the paucity of data regarding deaths, then the required probability may be obtained from the combination of the probability of death and the probable marital condition of the employee at the time of death. To secure these data in a form suitable for use it is necessary to graduate the proportions in each marital status at each age.

The assumption that these proportions could be considered the same in each of the four departments was not made at the outset, but the proportions for each fund were developed separately as the tabulations were completed. After that work was finished the results were compared, and the conclusion reached that it was unnecessary at this time to use separate ratios for each department in the valuations; consequently they were combined. The comparisons made between the figures for each of the four departments separately and those for the four combined are presented in two diagrams; the first of which shows the graduated proportion reported as husbands, and the second the graduated proportion reported as widowers or divorcees. A third diagram is presented showing on one sheet the two final curves derived from the combined data, together with what might be called the complementary curve showing the graduated proportion reported as single men.

When the proportions obtained from the four departments are compared with similar proportions from other funds for which figures are available, the proportion married in these New York services is found to be reasonably high, although it can hardly be said to be higher than was to have been expected from the figures from the other funds. The table on page 314 shows the comparison.

Attention should be called to the fact that the ratios for the various funds are not absolutely comparable, for the methods used in deriving them varied somewhat and in some instances the figures available were not in the form of proportions, or were unadjusted, or were given only for certain ages and therefore had to be worked over into comparable form by the Commission. These differences are not of such importance to warrant a detailed discussion, and it can be said that the bases are sufficiently alike to justify general comparisons for practical purposes.





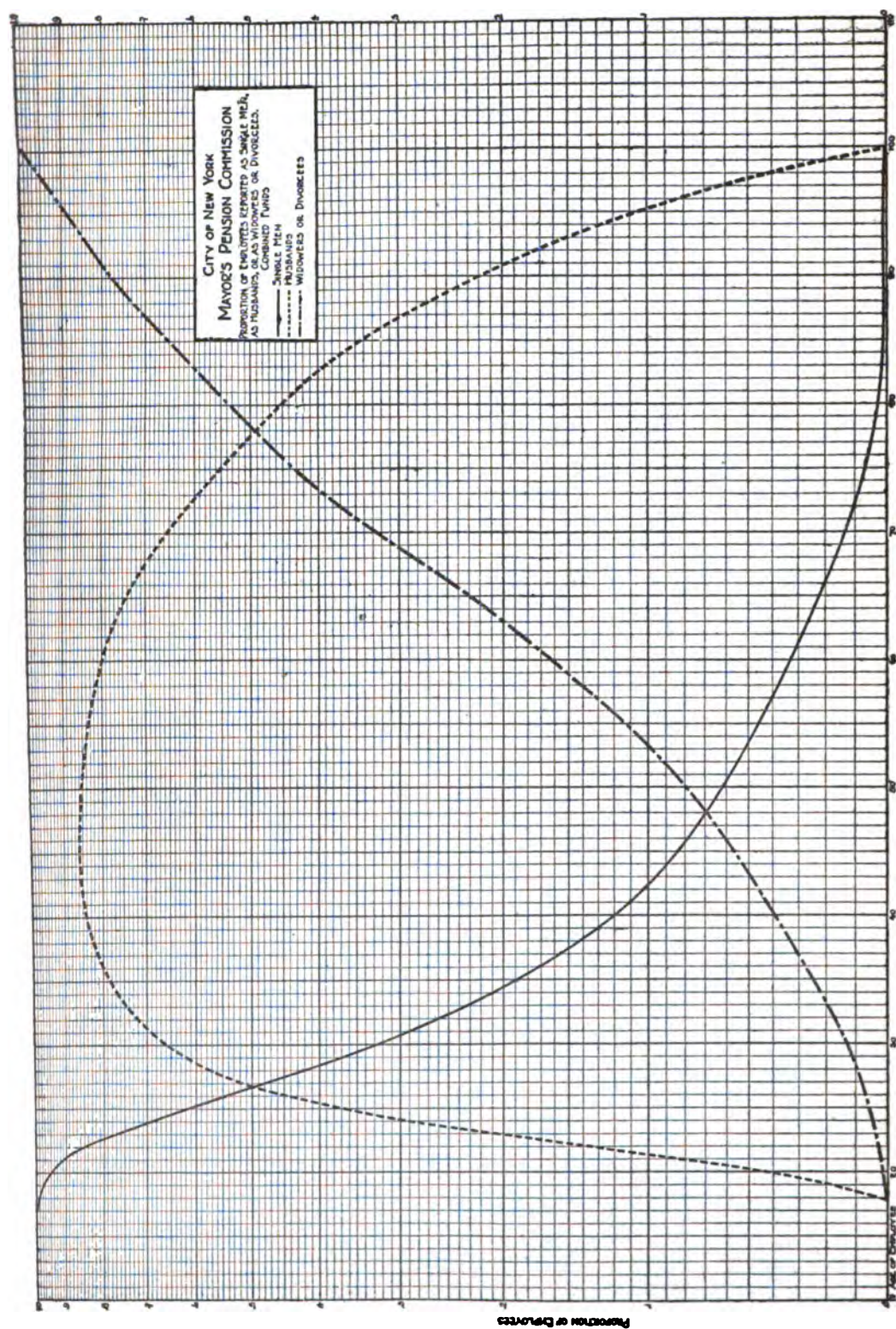


TABLE 175—COMPARISON OF PROPORTION MARRIED AMONG EMPLOYEES, IN NEW YORK CITY POLICE, FIRE, HEALTH AND STREET CLEANING DEPARTMENT FUNDS COMBINED, WITH SIMILAR RATIOS USED IN THE VALUATION OF OTHER FUNDS

AGE	PROPORTION MARRIED					
	N. Y. C. Employees in Four Departments	Norwegian Railway Employees and Population (Schjoll)	German Railway Employees (Behm)	New South Wales Public Service Employees (Trivett)	Employees in Scottish Banks (Hewat)	Employees in Canadian Banks (King)
17	...	.005	...	...	...	...
18	.0050	.015	...	...	...	...
19	.0210	.030	...	.005	...	...
20	.0480	.055	.0041	.010	.002	...
21	.0900	.090	.0213	.025	.006	...
22	.1450	.135	.0550	.050	.017	...
23	.2300	.195	.1065	.110	.036	...
24	.3060	.270	.1866	.185	.058	...
25	.3840	.360	.2896	.265	.088	...
26	.4550	.445	.4002	.340	.119	...
27	.5150	.525	.5101	.420	.151	.010
28	.5790	.600	.6168	.495	.188	.070
29	.6380	.665	.7065	.570	.250	.165
30	.6840	.720	.8172	.640	.300	.262
31	.7160	.765	.8382	.690	.351	.330
32	.7440	.800	.8707	.725	.400	.385
33	.7690	.830	.8943	.750	.446	.445
34	.7900	.855	.9111	.773	.495	.480
35	.8115	.877	.9225	.795	.542	.515
36	.8290	.896	.9318	.815	.581	.545
37	.8450	.912	.9401	.830	.613	.575
38	.8588	.924	.9471	.846	.641	.600
39	.8702	.932	.9506	.856	.657	.625
40	.8805	.936	.9508	.865	.671	.655
41	.8898	.935	.9481	.870	.680	.685
42	.8975	.934	.9462	.875	.691	.715
43	.9047	.933	.9424	.880	.700	.745
44	.9110	.931	.9392	.885	.711	.774
45	.9167	.929	.9391	.890	.718	.797
46	.9220	.927	.9367	.893	.724	.820
47	.9268	.924	.9399	.895	.728	.838
48	.9311	.921	.9302	.897	.730	.855
49	.9351	.917	.9248	.897	.734	.870
50	.9390	.913	.9143	.896	.739	.882
51	.9425	.909	.9044	.896	.744	.890
52	.9457	.904	.8889	.896	.749	.900
53	.9485	.899	.8722	.893	.754	.909
54	.9515	.894	.8542	.888	.756	.927
55	.9543	.888	.8391	.883	.761	.929
56	.9572	.882	.8280	.878	.764	.942
57	.9600	.876	.8233	.872	.768	.954
58	.9627	.869	.8203	.866	.774	.965
59	.9651	.862	.8223	.860	.778	.973
60	.9675	.854	.8188	.853	.786	.983
61	.9695	.846	.8017	.846	.793	.991
62	.9719	.837	.7695	.839	.801	1.000
63	.9742	.827	.7304	...	.807	1.000
64	.9761	.816	.6767	...	.813	1.000
65	.9782	.804	.6675	...	.826	1.000
66	.9801	.790	.6621	...	.820	...
67	.9821	.774	.6568	...	.822	...
68	.9839	.756	.6511	...	.822	...
69	.9858	.736	.6453	...	.822	...
70	.9872	.714	.6407	...	.822	...

The foregoing table does not include the ratios for the higher ages because comparative figures are not generally available for ages above these shown. The following table gives for every age the ratio used by the Pension Commission. The rate has been divided in the table so that the proportion found as husbands is shown separately from the proportion found as widowers or divorcees.

TABLE 176—PROPORTION OF ALL EMPLOYEES WHO ARE HUSBANDS, OR WIDOWERS OR DIVORCEES

Police, Fire, Health and Street Cleaning Department Funds Combined

Age x	Proportion Husbands pm^h_z	Proportion Widowers or Divorcees pm^w_z	Age x	Proportion Husbands pm^h_z	Proportion Widowers or Divorcees pm^w_z
18	.0046	.0004	60	.8030	.1645
19	.0200	.0010	61	.7930	.1765
20	.0462	.0018	62	.7839	.1880
21	.0878	.0022	63	.7741	.2001
22	.1420	.0030	64	.7611	.2150
23	.2261	.0039	65	.7482	.2300
24	.3011	.0049	66	.7341	.2460
25	.3782	.0058	67	.7171	.2650
26	.4482	.0068	68	.6959	.2880
27	.5072	.0078	69	.6758	.3100
28	.5700	.0090	70	.6562	.3310
29	.6275	.0105	71	.6364	.3525
30	.6715	.0125	72	.6171	.3730
31	.7011	.0149	73	.5979	.3940
32	.7262	.0178	74	.5785	.4145
33	.7482	.0208	75	.5591	.4350
34	.7667	.0233	76	.5392	.4560
35	.7855	.0260	77	.5212	.4750
36	.8004	.0286	78	.5009	.4960
37	.8137	.0313	79	.4818	.5160
38	.8243	.0345	80	.4605	.5375
39	.8330	.0372	81	.4398	.5590
40	.8404	.0401	82	.4170	.5820
41	.8465	.0433	83	.3950	.6040
42	.8507	.0468	84	.3718	.6275
43	.8547	.0500	85	.3494	.6500
44	.8573	.0537	86	.3235	.6760
45	.8594	.0573	87	.2976	.7020
46	.8605	.0615	88	.2722	.7275
47	.8613	.0655	89	.2458	.7540
48	.8611	.0700	90	.2189	.7810
49	.8603	.0748	91	.1959	.8040
50	.8588	.0802	92	.1729	.8270
51	.8565	.0860	93	.1529	.8470
52	.8539	.0918	94	.1319	.8680
53	.8497	.0988	95	.1110	.8890
54	.8452	.1063	96	.0870	.9130
55	.8398	.1145	97	.0670	.9330
56	.8342	.1230	98	.0460	.9540
57	.8275	.1325	99	.0250	.9750
58	.8204	.1423	100	.0020	.9980
59	.8119	.1532	...	...	...

RELATIVE AGES OF HUSBANDS AND WIVES

The probable age of the widow left by an employee dying must be used in determining the value of the annuity which becomes payable to her on the death of her husband. The following table shows the data for the four departments combined which were used as a basis for the development of the probable ages employed.

SECTION III

TABLE 177—TOTAL NUMBER OF MEMBERS' WIVES CLASSIFIED BY AGE AND BY AGE OF HUSBAND

[illegible]

TABLE 177—TOTAL NUMBER OF MEMBERS' WIVES CLASSIFIED BY AGE AND BY AGE OF HUSBAND—Continued

[illegible]

In preparing the relative age table, the average age of the wives of husbands of specified ages were first computed, separately for each department; the data were arranged according to the husbands' ages in five year age groups and the average age of the wives in each group was computed as of the central age of the husband. The results for the four departments were so nearly alike that the data were all combined before developing the final table. In preparing the final table the data were grouped similarly but average ages were not used. Instead the number of wives at each age was multiplied by the corresponding annuity value of a widow at that age and then the average annuity value, instead of the average age, was computed and graduated for each age of the husband. It was then possible to go to the annuity table and obtain from it the age which corresponded to the annuity and was the one best suited for the purposes of the valuation. This procedure made allowance for the mortality factor though the results differed very little from what might have been obtained directly from a graduation of the average ages. The following chart shows the unadjusted relative age of wife to that of husband in the various departments, together with the final adjusted relative ages obtained from all the data in the manner just described.

The table on page 320 shows the relative ages used compared with similar ages taken from reports on other funds. Attention is called to the fact that in cases where the age of wife in the comparative rate was shown as corresponding to that of husband at age x instead of at age $x + \frac{1}{2}$, no adjustments have been made, since such differences do not materially affect the comparisons.

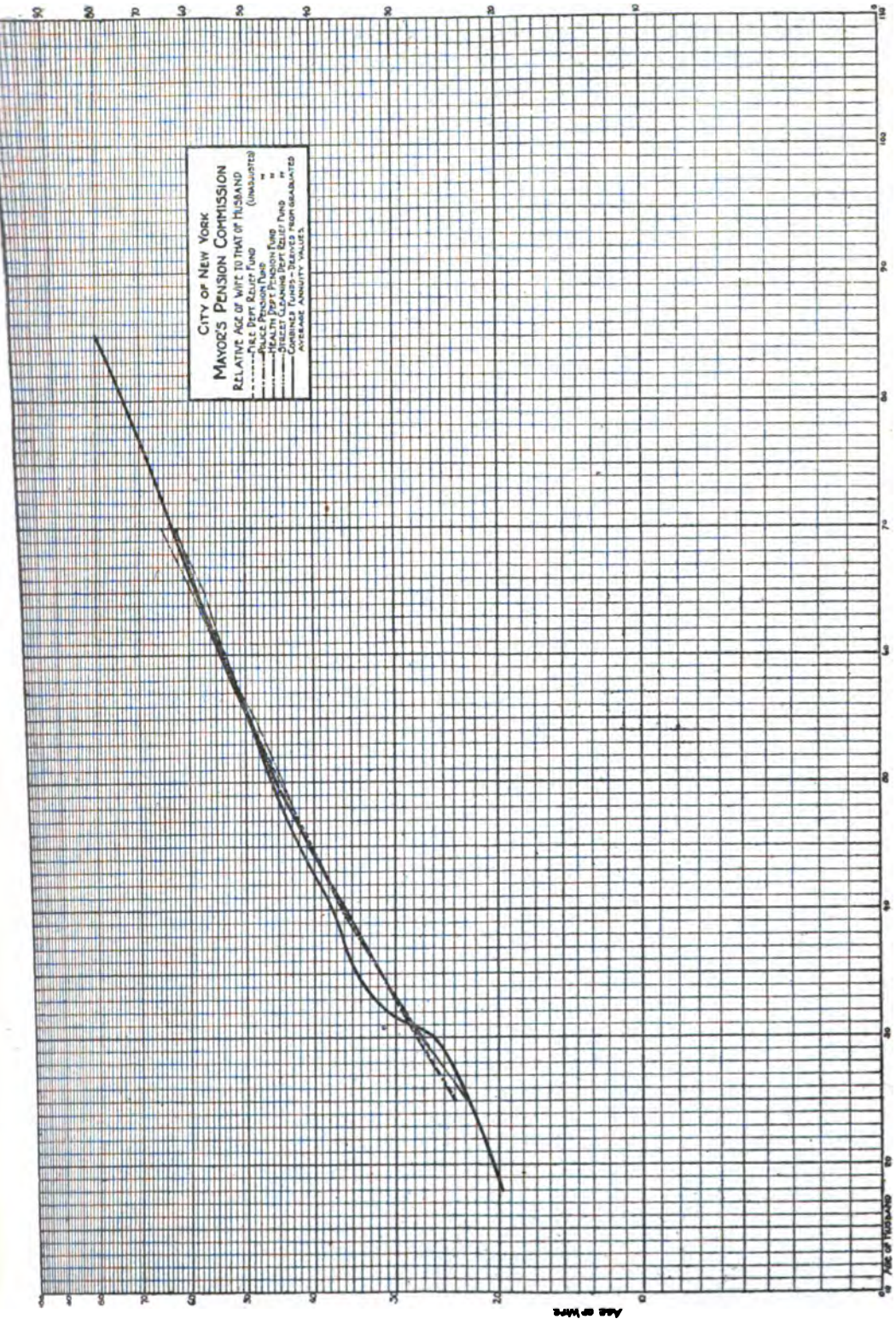


TABLE 178—RELATIVE AGE OF WIFE TO THAT OF HUSBAND, POLICE, FIRE, HEALTH AND STREET CLEANING DEPARTMENT FUNDS COMBINED, AND SIMILAR COMPARATIVE AGES USED IN THE VALUATION OF OTHER FUNDS

AGE OF HUS- BAND $x + \frac{1}{2}$	AGE OF WIFE (y)				
	New York City Employees in Four Departments	Norwegian Rail- way Employees and Population (Schjoll)	German Rail- way Employees (Behm)	Employees in Scottish Banks (Hewat)	Employees in Canadian Banks (King)
18½	19.95	21	..	.....	.....
19½	20.30	22	..	.....	.....
20½	20.67	22	28	22.0	.....
21½	21.05	23	24	22.4	.....
22½	21.45	24	23	22.8	.....
23½	21.95	24	24	23.2	.....
24½	22.45	25	24	23.6	.....
25½	22.98	26	25	24.0	.....
26½	23.40	27	26	24.8	25.0
27½	23.90	27	26	25.6	25.5
28½	24.45	28	27	26.4	26.5
29½	25.20	29	28	27.2	27.0
30½	26.06	29	28	28.0	28.0
31½	28.90	30	29	28.7	28.5
32½	31.10	31	30	29.4	29.0
33½	32.60	32	31	30.1	30.0
34½	33.75	33	32	30.8	30.5
35½	34.83	34	32	31.5	31.5
36½	35.45	35	33	32.1	32.0
37½	35.95	36	34	32.7	33.0
38½	36.50	37	35	33.3	34.0
39½	37.25	38	36	33.9	34.5
40½	37.95	39	37	34.5	35.5
41½	38.70	40	38	35.2	36.5
42½	39.50	41	39	35.9	37.5
43½	40.35	42	40	36.6	38.5
44½	41.20	42	41	37.3	39.5
45½	41.93	43	42	38.0	40.5
46½	42.85	44	43	38.8	41.5
47½	43.65	45	44	39.6	42.5
48½	44.40	45	44	40.4	43.5
49½	45.25	46	45	41.2	44.5
50½	46.03	47	46	42.0	45.5
51½	46.80	48	47	42.9	46.5
52½	47.60	49	48	43.8	47.5
53½	48.40	50	49	44.7	48.5
54½	49.25	50	50	45.6	49.5
55½	50.20	51	50	46.5	50.5
56½	51.00	52	51	47.4	51.5
57½	51.85	53	52	48.3	52.5
58½	52.65	54	53	49.2	53.5
59½	53.45	55	53	50.1	54.5
60½	54.49	56	54	51.0	55.5
61½	55.20	56	55	51.9	56.5
62½	56.10	57	56	52.8	57.5
63½	57.05	58	57	53.7	58.5
64½	57.85	59	57	54.6	59.5
65½	58.80	60	58	55.5	.....
66½	59.70	61	59	56.5	.....
67½	60.60	61	60	57.5	.....
68½	61.45	62	60	58.5	.....
69½	62.40	63	61	59.5	.....
70½	63.37	64	62	60.5	.....
71½	64.30	64	62	61.5	.....
72½	65.25	65	63	62.5	.....
73½	66.25	66	64	63.5	.....
74½	67.25	67	64	64.5	.....
75½	68.28	67	64	65.5	.....

TABLE 178—RELATIVE AGE OF WIFE TO THAT OF HUSBAND, POLICE, FIRE, HEALTH AND STREET CLEANING DEPARTMENT FUNDS COMBINED, AND SIMILAR COMPARATIVE AGES USED IN THE VALUATION OF OTHER FUNDS—Continued

AGE OF HUSBAND $x + \frac{1}{2}$	AGE OF WIFE (y)				
	New York City Employees in Four Departments	Norwegian Railway Employees and Population (Schioll)	German Railway Employees (Behm)	Employees in Scottish Banks (Hewat)	Employees in Canadian Banks (King)
76½	69.35	68	65	66.5	....
77½	70.45	69	65	67.5	....
78½	71.45	69	66	68.5	....
79½	72.70	70	66	69.5	....
80½	73.48	71	67	70.5	....
81½	75.00	72	67	71.5	....
82½	76.20	73	67	72.5	....
83½	77.40	73	..	73.5	....
84½	78.70	74	..	74.5	....
85½	79.95	74	..	75.5	....
86½	81.00	75	..	76.5	....
87½	82.05	76	..	77.5	....
88½	83.00	76	..	78.5	....
89½	83.60	77	..	79.5	....
90½	84.20	78	..	80.5	....
91½	84.75	..	..	81.5	....
92½	85.45	..	..	82.5	....
93½	86.00	..	..	83.5	....
94½	86.65	..	..	84.5	....
95½	87.45	..	..	85.5	....
96½	88.10	..	..	86.5	....
97½	88.75	..	..	87.5	....
98½	89.35	..	..	....	....
99½	89.95	..	..	....	....

DATA REGARDING EMPLOYEES' CHILDREN

Definite figures on the probable number of employees or pensioners who would die leaving children with a mother living, on the probable number leaving children without a mother living, and on the probable ages of such children at the time, were required for the valuation of pensions allowable under the four funds considered. The laws did not necessitate the valuation of a separate annuity to each child in a family as they provided for the payment of an annuity to the family as a unit and this annuity ordinarily was not decreased before its termination on the event of the youngest child reaching the age of eighteen. The Commission therefore made, for the purpose of this work, tabulations in which only the youngest child in each family was considered, in order to obtain the ages of such children as a basis for determining the value of the annuity. Tables showing the total number of children, classified by age and by the age of the father have, however, been prepared and are here presented because of their value as a basis for valuing annuities, which may possibly be provided in the future, directly dependent on the number of children and because of their general statistical value in showing the number of possible dependents to be provided for in a family. The first three of the following tables are based on the children in the family and the second three on the youngest child in the family.

**TABLE 179—TOTAL NUMBER OF HUSBANDS, WIDOWERS
AND THE NUMBER AND AGES**

Police, Fire, Health, and Street

AGE	Total Number	Number Without Children	Number With Children	Total Number of Children	NUMBER AND AGES OF CHILDREN—LAST BIRTHDAY							
					0	1	2	3	4	5	6	7
22	7	4	3	4	1	2	...	1	...	...	...	...
23	64	39	25	31	13	9	5	3	1	...	...	...
24	127	54	73	105	44	21	18	12	5	4	...	1
25	226	90	136	199	54	53	44	21	14	7	4	1
26	247	97	150	244	67	43	51	33	14	21	8	4
27	307	109	198	336	68	63	69	45	33	35	12	6
28	406	120	286	486	93	93	64	68	49	48	31	18
29	563	141	422	757	121	119	112	97	83	82	56	43
30	695	191	504	939	129	124	124	121	108	94	81	66
31	656	146	510	1,040	123	133	123	105	133	114	102	74
32	704	162	542	1,165	126	120	135	119	131	134	100	84
33	655	148	507	1,128	110	117	114	115	116	121	91	100
34	692	137	555	1,346	95	122	146	123	119	129	132	105
35	736	148	588	1,527	121	121	136	131	135	137	138	125
36	742	120	622	1,550	111	104	116	121	124	136	111	129
37	717	137	580	1,615	94	95	110	121	124	133	123	147
38	721	132	589	1,773	105	100	105	123	115	129	127	132
39	654	112	542	1,647	87	86	84	102	104	115	120	115
40	610	95	515	1,638	68	75	79	106	91	83	129	98
41	570	77	493	1,668	56	69	73	84	83	92	104	108
42	579	70	509	1,699	44	75	62	67	96	82	102	90
43	468	78	390	1,358	35	38	37	60	60	63	66	67
44	543	79	464	1,703	41	40	58	52	60	65	65	75
45	528	55	473	1,716	36	61	39	60	75	70	65	86
46	477	68	409	1,476	27	23	35	36	38	47	60	61
47	442	65	377	1,401	20	21	29	35	27	50	49	57
48	361	48	313	1,213	13	15	17	30	25	28	37	39
49	323	44	279	1,115	7	16	11	22	25	34	40	36
50	375	49	326	1,296	10	19	16	20	30	18	35	37
51	361	27	334	1,389	4	10	10	17	20	22	38	40
52	351	28	323	1,234	7	10	8	18	18	23	25	31
53	299	33	266	1,090	6	6	8	9	10	9	15	25
54	333	31	302	1,311	6	8	6	3	12	14	22	31
55	279	31	248	1,074	3	4	5	6	16	8	13	17
56	212	20	192	817	5	4	3	3	7	6	15	13
57	165	13	152	619	1	1	5	6	3	5	4	6
58	131	16	115	485	3	...	6	3	3	4	4	9
59	116	18	98	420	1	1	1	2	3	3	1	6
60	111	10	101	394	...	...	...	...	2	1	1	2
61	82	9	73	274	...	...	...	...	1	1	...	3
62	64	4	60	266	...	1	1	5	2	2	4	1
63	54	6	48	185	...	...	2	...	...	...	...	...
64	53	3	50	202	...	...	1	...	...	...	...	...
65	35	6	29	112	...	...	...	...	...	...	...	...
66	35	7	28	100	...	...	...	...	...	...	...	...
67	18	3	15	44	...	...	...	...	...	...	...	...
68	15	3	12	43	...	...	...	...	...	...	...	...
69	12	...	12	49	...	...	...	...	...	...	...	...
70	10	1	9	33	...	...	...	...	...	...	...	...
71	8	...	8	30	...	...	...	...	...	...	...	...
72	8	1	7	24	...	...	...	...	...	...	...	...
73	4	1	1	6	...	...	...	...	...	...	...	...
74	4	2	4	13	...	...	...	...	...	...	...	...
75	1	...	1	6	...	...	...	...	...	...	...	...
76	1	...	1	3	...	...	...	...	...	...	...	...
77	1	...	1	2	...	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...	...	...	...	...	...
79	1	...	1	4	...	...	...	...	...	...	...	...
80	1	...	1	6	...	...	...	...	...	...	...	...
81	...	...	...	...	...	...	...	...	...	...	...	...
82	1	...	1	3	...	...	...	...	...	...	...	...
Total	16,961	3,088	13,873	42,413	1,955	2,022	2,068	2,120	2,130	2,170	2,164	2,089

N. B.—Tabulations include Adopted Children

AND DIVORCEES MAKING A FAMILY HISTORY REPORT OF ALL THEIR CHILDREN

Cleaning Department Funds Combined

NUMBER AND AGES OF CHILDREN—LAST BIRTHDAY													
8	9	10	11	12	13	14	15	16	17	18	19	20	21 +
...
...
...
...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
3	1	...	1	...	...	...	...	...	...	...	...	...	...
6	7	3	...	2	1	...	1	1	...	...	...	...	...
22	12	5	2	2	...	1	...	...	...	...	...	...	...
43	21	14	4	4	2	1	1	...	1	...	...	1	...
57	28	21	17	8	2	...	...	...	...	...	...	...	...
74	51	34	35	12	6	2	1	1	...	...	...	...	...
59	70	44	35	21	3	5	4	...	...	1	1	1	...
109	77	68	46	31	22	13	6	2	1	...	...	...	...
118	99	70	71	45	29	24	17	8	2	...	...	...	...
116	103	89	84	64	49	31	28	16	12	4	2	...	...
111	117	95	91	70	60	44	34	21	14	3	3	...	5
115	127	103	109	85	81	64	49	39	24	19	9	3	10
120	106	83	108	90	82	79	50	43	39	16	11	3	4
113	112	100	103	88	89	80	58	66	35	33	18	10	4
119	120	110	84	103	90	86	76	69	49	40	21	17	15
99	90	106	94	108	99	100	72	74	72	53	43	35	36
69	81	58	90	75	98	84	76	70	72	46	35	26	52
94	93	98	109	101	105	96	74	75	89	75	37	54	102
73	91	72	94	115	100	88	84	94	92	78	65	53	125
73	65	74	77	80	83	87	91	77	78	71	67	65	161
73	49	73	74	77	62	83	73	76	91	71	62	56	193
53	42	55	52	56	57	72	68	68	65	63	62	56	240
36	41	47	51	62	44	70	61	62	65	60	52	49	224
39	48	51	58	53	64	58	69	67	78	70	59	54	334
39	50	46	52	58	61	79	70	74	67	62	82	80	408
42	39	35	48	58	47	68	47	63	73	52	72	63	387
17	32	40	41	44	48	45	47	51	64	61	62	62	388
24	41	30	52	48	57	64	67	56	67	61	66	60	516
18	26	28	31	27	45	45	37	45	60	52	58	59	471
14	20	20	23	31	24	32	35	31	37	42	33	31	382
9	7	16	16	13	18	25	25	18	36	29	33	31	312
5	3	9	12	16	11	15	14	18	15	23	24	20	268
8	10	9	15	12	10	16	17	12	22	16	22	18	215
4	5	6	4	10	11	15	8	17	12	15	24	17	238
1	1	...	2	3	2	5	7	8	12	9	8	11	200
6	6	3	7	2	5	4	6	9	13	5	9	13	162
1	3	2	2	2	3	6	4	6	7	7	6	15	118
...	...	1	1	1	1	3	1	9	4	8	7	9	155
...	1	...	...	1	...	1	5	1	3	4	7	3	86
...	1	...	...	...	...	1	...	1	1	1	4	7	84
1	...	...	...	...	...	1	...	...	...	1	...	...	41
...	1	...	...	...	...	...	1	...	...	...	1	1	39
...	...	1	...	1	...	...	...	1	...	1	...	...	43
1	...	...	1	...	2	...	...	...	...	...	...	1	27
1	...	...	...	1	...	...	1	...	1	...	1	...	25
...	...	...	...	...	...	...	...	...	...	...	...	...	24
...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	...	13
...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	2
...
...	...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	...	6
...
...	...	...	...	...	...	...	...	...	...	...	...	...	3
1,988	1,898	1,719	1,797	1,680	1,573	1,593	1,385	1,349	1,373	1,152	1,067	984	6,137

TABLE 180—NUMBER OF HUSBANDS MAKING A FAMILY THEIR

Police, Fire, Health and Street Cleaning

Age of Husband	Total Number	Number Without Children	Number With Children	Total Number of Children	NUMBER AND AGES OF CHILDREN—LAST BIRTHDAY							
					0	1	2	3	4	5	6	7
22	7	4	3	4	1	2	...	1	...	...	...	...
23	64	39	25	31	13	9	5	3	1	...	...	...
24	124	51	73	105	44	21	18	12	5	4	...	1
25	221	88	133	194	52	52	44	20	14	6	4	1
26	244	94	150	244	67	43	51	33	14	21	8	4
27	305	108	197	333	68	63	69	45	32	35	12	5
28	402	119	283	482	93	93	64	68	49	46	31	17
29	555	139	416	747	121	117	110	97	83	80	55	42
30	678	183	495	927	129	124	124	120	108	92	80	64
31	644	143	501	1,027	123	130	121	105	133	110	102	73
32	683	155	528	1,140	125	119	133	115	129	131	97	83
33	635	139	496	1,103	110	117	113	114	114	117	88	90
34	670	130	540	1,316	93	121	145	122	119	125	129	90
35	712	141	571	1,491	121	120	134	131	132	133	134	119
36	718	115	603	1,516	111	102	116	118	121	132	105	129
37	702	133	569	1,592	94	95	110	120	124	132	119	145
38	691	122	569	1,713	104	100	105	120	114	125	122	124
39	627	107	520	1,592	87	84	84	99	100	111	112	114
40	579	88	491	1,582	68	75	79	105	91	81	125	94
41	539	69	470	1,594	56	69	70	80	80	87	100	104
42	554	69	485	1,644	44	75	60	66	95	80	102	87
43	440	73	367	1,285	35	38	36	60	60	61	61	65
44	523	76	447	1,646	41	40	58	52	73	63	93	73
45	495	48	447	1,651	35	61	37	60	73	69	63	85
46	448	62	386	1,409	27	23	35	35	38	46	59	57
47	409	56	353	1,318	20	19	28	34	27	49	49	53
48	331	42	289	1,118	13	14	17	28	25	26	37	36
49	294	41	253	1,026	7	15	11	20	24	20	37	34
50	353	45	308	1,235	10	19	16	28	30	18	34	30
51	335	22	313	1,336	4	10	10	17	20	22	38	39
52	321	26	295	1,138	7	10	8	18	17	22	24	30
53	267	30	237	991	5	6	7	9	9	7	15	25
54	294	28	266	1,160	6	8	6	3	12	13	21	29
55	248	29	219	960	3	4	5	6	16	7	12	15
56	191	20	171	723	5	4	2	8	6	6	15	12
57	140	12	128	539	1	...	4	6	3	4	3	5
58	110	11	99	419	3	...	6	6	3	4	4	8
59	90	15	75	325	1	...	1	3	2	3	...	5
60	96	10	86	345	...	...	...	2	2	1	3	2
61	63	7	56	207	...	...	...	...	1	1	...	2
62	57	4	53	242	...	1	1	...	...	...	...	...
63	44	4	40	161	...	...	2	5	2	2	4	1
64	44	2	42	178	...	...	1	...	...	...	...	...
65	24	3	21	84	...	...	...	...	...	...	...	...
66	26	6	20	67	...	...	...	...	...	...	...	...
67	13	3	10	28	...	...	...	...	...	...	...	...
68	11	2	9	33	...	...	...	...	...	...	...	...
69	8	...	8	29	...	...	...	...	...	...	...	...
70	8	1	7	26	...	...	...	...	...	...	...	1
71	5	...	5	24	...	...	...	...	...	...	...	...
72	1	...	1	2	...	...	...	...	...	...	...	...
73	3	...	1	6	...	...	...	...	...	...	...	...
74	3	2	3	10	...	...	...	...	...	...	...	...
75	1	...	1	6	...	...	...	...	...	...	...	...
76	...	...	...	...	...	...	...	...	...	...	...	...
77	...	...	...	...	...	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...	...	...	...	...	...
79	1	...	1	4	...	...	...	...	...	...	...	...
80	...	...	...	...	...	...	...	...	...	...	...	...
81	...	...	...	...	...	...	...	...	...	...	...	...
82	1	...	1	3	...	...	...	...	...	...	...	...
Total	16,052	2,916	13,136	40,111	1,947	2,003	2,046	2,088	2,101	2,102	2,099	2,014

HISTORY REPORT AND THE NUMBER AND AGES OF ALL OF CHILDREN

Department Funds Combined

NUMBER AND AGES OF CHILDREN—LAST BIRTHDAY													
8	9	10	11	12	13	14	15	16	17	18	19	20	21+
...
...
...
...	1	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	1	...	...	...	...	...	...	...	...	...	...
5	7	3	1	2	1	...	1	1	...	...	...	...	...
22	10	5	2	2	...	1	...	...	...	...	...	...	...
43	18	13	4	2	2	1	1	...	1	...	...	1	...
56	28	21	16	7	2	...	...	...	...	...	...	...	...
70	50	34	33	12	5	2	1	1	...	...	...	...	...
58	69	41	33	19	3	4	4	...	...	1	1	1	...
107	75	63	45	30	21	13	6	2	1	...	...	...	...
115	94	68	69	43	28	24	16	8	2	...	...	...	...
113	99	88	82	64	47	30	27	14	12	4	2	...	...
110	113	93	88	69	58	43	33	21	14	3	3	...	5
113	121	99	105	79	76	63	44	38	22	18	8	3	10
116	100	79	104	86	80	77	49	42	38	15	10	3	2
107	107	95	100	82	86	77	55	63	31	30	18	9	4
115	115	107	82	99	86	80	72	65	46	33	21	13	14
97	85	103	90	105	91	97	79	69	68	51	42	34	33
66	77	50	86	65	92	79	74	66	65	43	33	24	49
92	89	93	104	99	101	93	72	73	84	71	36	51	95
71	90	67	90	109	96	84	79	89	89	73	63	50	118
69	64	70	75	74	81	83	88	74	74	68	62	61	146
72	46	70	71	72	57	77	70	69	85	63	57	54	176
51	40	52	44	53	54	68	60	63	57	58	55	50	217
33	37	43	46	58	42	67	57	58	63	54	49	42	200
39	47	50	56	52	61	57	66	64	76	64	56	52	304
39	49	44	50	56	59	78	66	71	63	59	80	74	388
39	36	31	46	55	43	65	43	62	66	47	63	61	345
17	30	39	35	40	44	42	44	44	62	53	55	54	349
22	37	29	48	43	50	55	60	42	65	50	57	56	448
17	21	24	27	24	41	42	34	38	51	48	50	54	421
12	19	20	22	29	23	29	32	28	31	39	29	28	324
8	7	14	14	13	14	24	22	18	30	27	23	28	271
4	3	9	11	14	10	14	14	13	14	20	21	17	224
7	8	6	14	11	7	13	13	9	18	13	16	15	161
4	5	6	3	8	11	15	8	16	11	13	20	17	200
1	1	...	1	3	1	4	6	6	10	7	6	8	149
6	6	3	7	2	5	4	5	9	11	5	8	9	146
1	3	2	2	2	3	6	4	6	7	7	6	13	96
...	...	1	1	1	1	3	1	8	4	7	7	7	135
...	1	...	...	1	...	1	5	...	3	3	6	2	62
...	1	...	...	...	...	1	...	1	...	1	1	3	59
1	...	...	...	...	...	1	...	...	...	...	...	...	26
...	1	...	...	...	...	...	1	...	...	...	1	1	29
...	...	1	...	1	...	...	...	...	1	1	...	...	24
1	...	...	1	...	2	...	...	...	...	...	...	1	20
1	...	...	...	1	...	...	1	...	1	...	1	...	19
...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	...	10
...	...	...	...	...	...	...	...	...	...	...	...	...	6
...
...
...	...	...	...	...	...	...	...	...	...	...	...	...	4
...
...	...	...	...	...	...	...	...	...	...	...	...	...	3
1,926	1,810	1,636	1,709	1,587	1,484	1,517	1,304	1,251	1,275	1,049	967	896	5,300

TABLE 181—NUMBER OF WIDOWERS AND DIVORCEES MAKING A FAMILY HISTORY REPORT AND THE NUMBER AND AGES OF ALL OF THEIR CHILDREN—Continued.

Police, Fire, Health and Street Cleaning Department Funds Combined

Age of Widower or Divorcee	Total Number	Number Without Children	Number With Children	Total Number of Children	NUMBER AND AGES OF CHILDREN—LAST BIRTHDAY																					
					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
53	32	3	29	99	1	..	1	..	1	2	..	..	..	2	1	6	4	4	3	3	7	2	8	7	8	39
54	39	3	36	151	..	..	..	..	..	1	1	2	2	4	1	4	5	7	9	7	14	2	11	9	4	68
55	31	2	29	114	..	..	..	..	..	1	1	2	1	5	4	4	3	4	3	3	7	9	4	8	5	50
56	21	..	21	94	..	..	1	1	..	..	..	1	1	1	2	2	..	2	1	3	3	6	4	3	58	
57	25	1	24	80	..	1	1	1	..	1	1	1	1	..	2	2	..	4	1	3	..	6	2	10	3	41
58	21	5	16	66	..	..	..	..	..	..	..	1	1	..	..	1	2	1	1	5	1	1	3	3	44	
59	26	3	23	95	..	1	..	..	1	..	1	1	1	2	3	1	1	3	3	4	3	4	3	6	3	54
60	15	..	15	49	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	1	1	1	2	4	..	38
61	19	2	17	67	..	..	..	..	..	..	..	1	..	..	..	1	..	1	1	1	2	2	2	2	3	51
62	7	..	7	24	..	..	..	7	..	..	..	1	..	..	..	1	..	..	..	1	..	2	..	1	4	16
63	10	2	8	24	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	22
64	9	1	8	24	..	..	..	9	..	..	..	..	..	24	..	..	..	..	..	1	..	..	1	..	2	20
65	11	3	8	28	..	..	..	11	3	..	..	..	..	8	..	..	..	8	..	1	1	..	1	1	1	24
66	9	1	8	33	..	..	..	9	1	..	..	..	..	..	..	..	..	..	..	..	1	1	..	3	4	25
67	5	..	5	10	..	..	..	5	..	..	..	..	..	10	..	..	..	..	..	..	..	..	1	..	15	
68	4	1	3	10	..	..	..	4	1	..	..	..	..	10	..	..	..	..	..	1	..	..	..	..	10	19
69	4	..	4	20	..	..	..	4	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	7	6
70	2	2	2	7	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22
71	3	..	3	6	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
72	7	1	6	22	..	..	..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
73	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
74	1	..	1	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
76	1	1	1	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
77	1	..	1	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	1	..	1	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
Total.....	909	172	737	2,302	8	19	22	32	29	68	65	75	62	88	83	88	93	89	76	81	98	98	103	100	88	837

TABLE 182—TOTAL NUMBER OF HUSBANDS, WIDOWERS AND DIVORCEES COMBINED, REPORTING CHILDREN, AND A CLASSIFICATION OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY

Police, Fire, Health and Street Cleaning Department Funds Combined

Age	Number With Children	NUMBER AND AGES OF YOUNGEST CHILDREN—LAST BIRTHDAY																					
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
22	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	25	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	73	16	9 ¹	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	136	46	23	7	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	150	36	28	11	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	198	68	37	15	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	286	93 ¹	82 ²	24	23 ¹	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	422	121 ¹	70 ¹	41 ¹	27	25 ¹	11	11	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...
30	504	129	87	59	37	33 ¹	17	14	5	3	3	...	...	...	...	...	...	...	...	...	...	...	...
31	510	122 ²	121 ¹	76	50 ¹	49 ¹	36	23	17	11	5	2	3	1	...	...	...	...	...	...	...	...	...
32	542	126 ¹	110	82	60	50	45	16	13	10	12	7	7	2	2	1	...	...	...	...	...	...	...
33	507	110	100	73	53	41	37	26	24	12 ¹	15	11	4	1	...	...	...	...	...	...	...	...	...
34	555	95 ¹	113	92 ¹	57	43	40 ¹	33	19	23	16	17 ²	2	2	4	2	1	...	...	...	...	...	...
35	588	121 ²	112 ¹	70	51	49	44	34 ¹	26	21	21	4	9	5	4	4	1	...	...	...	...	...	...
36	622	111 ¹	85	78 ¹	62 ¹	41	44	33	38	25	31	22 ¹	15	15 ¹	7	9	5	2	2	...	...	...	...
37	580	94 ¹	90 ¹	61	46 ¹	50	42	42	38	24	14	17	17	17	8	6	4	3	4	...	...	...	...
38	589	104	91 ²	65 ¹	47	58 ¹	43	28	35	22	29	16	14	11	13	14	7	7	2	2	...	...	...
39	542	87	76	45	53 ¹	43	32	30	30	22	19	13	14	14	14	12	3	10 ¹	5	2	2	...	...
40	515	66	66	40	59 ²	34 ¹	30	46	17	19	25	15	16	20 ¹	19	14	3	10	10	4	2	...	...
41	493	56 ²	64	48 ¹	46 ¹	36	29	36 ¹	26	20 ¹	24 ¹	18	16	17	19	15	13	11	8	7	8 ¹	...	...
42	509	44 ²	71	44 ¹	34	37	29 ¹	35	25	21	21	26	20	22 ²	19	15	13	11	8	7	8 ¹	...	...
43	390	35	38	24	32 ¹	30	21	21	16	16	21	19	17	16	24 ¹	19	7	9	9	6	4	...	...
44	404	41	33	46	25	35	18	34	20	34	19	23	19	21	21	19	12	13	11	7	3	...	...
45	473	36	55	25	35	25	24	19	25 ¹	16	24	13	25	31 ¹	17	14	20	16	18 ¹	9	6	...	...
46	409	27 ¹	21	23	25	24	20	20 ¹	24 ¹	21	15	19	16	18	19	25 ¹	15 ²	14	11	8	12 ¹	...	...
47	377	20	19 ¹	20 ¹	24	10	29	26	26	16	15	25	25	18	13	14	11	16	13	7	7	...	...
48	313	13	13	15	17	10	15	16	16	21 ¹	19 ¹	17	17	15	11	13	6	11	11	8	4	...	...
49	279	7	16	8	15 ¹	11	20 ¹	23	17	12	16	15	11	15	11	13	6	11	11	12	5	...	...
50	326	10	18	9	19 ¹	14	5 ¹	15	10	19	18	22	15	12	12	14	20	11	21 ¹	12	7	...	...
51	334	4	9	8	15 ¹	14	11	17	24	22	16	13	14	15	19	14	9	14	13	9	10	...	...
52	323	7	9	7	10	8	14	12	16	21	15	10	19	19	10	19	13	9	14	9	11	...	...

N. B.—Index figure indicates the number of pairs of twins included in total number to which it is affixed.

TABLE 182—TOTAL NUMBER OF HUSBANDS, WIDOWERS AND DIVORCEES COMBINED REPORTING CHILDREN, AND A CLASSIFICATION OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY—Continued

Police, Fire, Health and Street Cleaning Department Funds Combined

AGE	Number With Children	NUMBER AND AGES OF YOUNGEST CHILDREN—LAST BIRTHDAY																					
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
53	266	6	5	7	5	2	7	7	12	8	16	22	19	19	19	11	12	7	17	13	10	9	33
54	302	6	6	5	2	7	10	14	19	12	18	14	20	15	21	18	13	12	14	16	10	5	45
55	248	3	3	4	3	12	5	6	10	10 ¹	10	13	11	8	21	12	10	11	14 ¹	11	9	5	55
56	192	5	4	2	7	4	1	10	7	7	9	12	7	14	9 ¹	11 ¹	4	10	7 ¹	13	2	5	45
57	152	1	1	5	3	2	4	1	1	1	3	10	10	5	1	8	11	8	10	8 ¹	10	4	39
58	115	3	...	4	2	1	...	4	2	4	1	4	8	6	8	4	4	2	4	8	5	8	33
59	98	1	1	1	1	2 ¹	1	3	2	2	2	6	8	3	1	7	2	2	2	5	6	3	34
60	101	...	...	...	...	...	1	1	2	2	4	4	2	6	5	5	2	8	1	3	6	7	40
61	73	...	...	...	...	1	1	1	3	1	...	...	...	4	1	3	4	5	5	3	3	5	34
62	60	...	1	...	4 ¹	1	1	...	...	3	2	1	2	...	...	...	2	2	4	4	1	2	28
63	48	...	...	2	...	...	...	1	...	...	2	1	1	...	...	...	2	2	4	4	3	5	21
64	50	...	...	1	...	...	...	...	...	...	...	1	1	...	...	3	2	1	3	3	3	5	26
65	29	...	...	...	...	...	...	...	...	...	1	...	...	1	...	2	...	7	1	2	2	1	15
66	28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	1	1	3	2	1
67	15	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	1	1	4 ¹	3
68	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
69	12	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	1	9
70	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	8
71	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
72	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
73	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
74	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
75	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
76	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
77	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
78	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
79	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
80	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
82	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Total	13,873	1,952 ¹⁸	1,814 ¹¹	1,311 ⁸	1,039 ¹⁸	852 ⁷	755 ⁴	667 ³	593 ³	502 ¹	490 ²	441 ³	407	382 ⁸	348 ⁸	350 ³	241 ²	251 ¹	246 ⁴	211 ¹	173 ³	159	791

N. B.—Index figure indicates the number of pairs of twos included in total number to which it is affixed.

TABLE 183—NUMBER OF HUSBANDS REPORTING CHILDREN AND A CLASSIFICATION BY AGE OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY

Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF HUSBAND	Number With Children	NUMBER AND AGES OF YOUNGEST CHILDREN—LAST BIRTHDAY																		
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
22	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	25	13	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	73	44	16	9 ¹	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	133	52	45	23	7	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...
26	150	66 ¹	28	11	6	...	...	3	...	1	...	...	...	...	...	...	...	...	...	...
27	197	68	56	37	15	9	...	4	...	...	...	...	...	...	...	...	...	...	...	...
28	283	93 ¹	82 ²	39	24	23 ¹	13	7	...	...	...	...	...	...	...	...	...	...	...	...
29	416	121 ¹	106	69 ¹	41 ¹	27	24 ¹	11	3	1	...	...	...	...	...	...	...	...	...	...
30	495	129	112 ²	87	58	37 ²	31 ¹	17	12	5	4	4	...	...	...	...	...	...	...	...
31	501	122 ²	118	74	50 ¹	49 ¹	33	23	16	11	4	2	2	1	...	1	...	...	...	...
32	528	125 ¹	109	81	56	40	43	16	13	8	...	7	7	2	1	1	...	...	...	...
33	496	110	100	72	52	40	34	25	23	11 ¹	15	10	4	...	...	...	...	...	...	...
34	540	93 ¹	112	91 ¹	56	43	37	31	16	23	15	15 ²	2	2	4	2	1	1	...	...
35	571	121 ²	111 ¹	68	65 ¹	47	40	32 ¹	24	20	19	3	9	5	4	4	5	1	4	...
36	603	111 ¹	83	78 ¹	59 ¹	38	41	31	38	24	30	22 ¹	14	15 ¹	6	8	4	3	4	...
37	569	94 ¹	90 ¹	76	45 ¹	50	41	38	36	24	14	16	16	7 ¹	6	8	4	3	4	...
38	569	104	91 ²	65 ¹	44	57 ¹	40	26	31	22	27	15	13	9	7	10	7	2	1	...
39	520	87	74	45	50 ¹	39	41	29	29	21	15	13	13	13	13	14	7	7	2	...
40	491	66	66	49	58 ¹	34 ¹	28	42	15	18	23	13	14	19 ¹	13	11	2	8 ¹	9	...
41	470	56 ²	64	45 ¹	42 ¹	34	28	34 ¹	26	19 ¹	23 ¹	17	16	17	16	11	4	10	7	...
42	485	44 ²	71	42 ¹	33	36	29 ¹	35	23	20	19	18	18	21 ²	16	13	12	9	8	...
43	367	35	38	23	32 ¹	30	19	17	16	14	20	16	15	13	22 ¹	18	7	9	6	...
44	447	41 ¹	33	46	25	33	17	32	20	33	17	20	17	21	20	18	11	12	11 ¹	...
45	447	35	55	25	35	23	23	19	24 ¹	16	23	10	21	27 ¹	16	13	17	12	9	...
46	386	27 ¹	21	23	24	24	19	10 ¹	21 ¹	19	15	16	16	17	19	22 ¹	14	14	11	...
47	353	20	17 ¹	20 ¹	24	10	29	20	22	16	14	23	22	15	12	13	11	13	6	...
48	289	13	12	15	16	10	13	16	15	20 ¹	19	15	15	14	17	19	10	10	5	...
49	253	7	15	8	14 ¹	10	16	22	15	12	13	13	11	15	11	13	6	3	3	...
50	308	10	18	9	18 ¹	14	5 ¹	15	9	19	18	21	14	11	11	14	17	11	21 ¹	...
51	313	4	9	8	15 ¹	14	11	17	23	22	15	12	12	15	19	14	8	12	8	...
52	295	7	9	7	10	7	13	11	16	19	13	9	17	18	9	18	12	9	12	...

N. B.—Index figure indicates the number of pairs of twins included in total number to which it is affixed.

TABLE 183—NUMBER OF HUSBANDS REPORTING CHILDREN AND A CLASSIFICATION BY AGE OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY—Continued

Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF HUSBAND	Number With Children	NUMBER AND AGES OF YOUNGEST CHILDREN—LAST BIRTHDAY																					
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
53	237	5	5	7	5	2	6	7	12	8	14	22	15	15	18	9	12	6	16	12	6	8	27
54	266	6	6	5	2	7	9	13	18	11	15	13	18	11	18	10	11	8	14	14	10	5	36
55	219	3	3	4	3	12	4	5	9	9 ¹	8	11	8	8	19	12	10	9	9	10	7	8	49
56	171	5	4	1	6	4	1	10	7	6	9	12	7	12	8 ¹	10 ¹	4	8	3	11 ¹	2	5	39
57	128	1	...	4	3	2	4	4	1	1	3	9	9	3	1	8	10	8	6	7	6	3	31
58	99	3	...	4	2	1	...	4	1	1	1	4	8	3	...	4	4	1	1	3	4	7	26
59	75	1	...	1	1	2	3	...	2	5	1	4	8	5	...	6	1	1	1	3	6	3	23
60	86	...	...	...	2 ¹	1	1	2	2	2	4	4	1	4	5	5	2	7	...	3	6	7	30
61	56	...	...	...	...	1	...	...	1	3	...	...	...	3	1	2	4	5	4	2	2	4	24
62	53	...	1	...	4 ¹	1	...	...	...	...	2	1	1	...	...	...	1	2	3	3	...	1	25
63	40	...	...	2	...	...	...	...	...	...	...	1	1	...	...	3	2	1	1	3	3	3	15
64	42	...	...	1	...	...	...	...	...	...	...	1	1	...	...	2	...	6	2	4	2	...	10
65	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	2	...	...	15
66	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10
67	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
68	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
69	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
70	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
71	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
72	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
73	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
74	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
75	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
76	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
79	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
82	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Total...	13,136	1,945 ¹²	1,795 ¹⁰	1,295 ⁸	1,011 ¹⁵	830 ⁷	708 ⁶	634 ⁵	554 ³	481 ⁴	450 ²	402 ¹	367	346 ⁶	322 ²	326 ²	221 ³	221 ¹	218 ⁴	184 ¹	148 ¹	136	637

N. B.—Index figure indicates the number of pairs of twins included in total number to which it is affixed.

TABLE 184—NUMBER OF WIDOWERS AND DIVORCEES REPORTING CHILDREN AND A CLASSIFICATION
BY AGE OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY
Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF WIDOWER OR DIVORCEE	Number With Children	NUMBER AND AGES OF YOUNGEST CHILDREN—LAST BIRTHDAY																					
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
25	3	2	1																				
26	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	3	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	6	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	9	..	2	1	2	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..
30	9	..	..	..	3	..	3	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..	..
31	9	..	3 ¹	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
32	14	1	1	1	2	..	2	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..
33	11	..	..	1	3	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
34	15	..	1	1	3 ¹	2	2	3	2	1	2	..	..	..	..	..	..	1	..	..	..	..	..
35	17	1	1	2	3	2	2	3	2	1	2	..	..	..	..	..	..	..	..	..	..	..	..
36	19	2	2	..	3	2	2	2	2	1	1	..	1	..	1	1	..	1	..	..	..	..	..
37	11	..	..	..	1	4	4	2	2	..	..	1	1	2	1	1	..	..	..	..	..	..	..
38	20	..	..	..	3	2	2	4	2	..	2	1	1	1	1	1	..	..	..	..	..	..	..
39	22	..	2	..	3	3	2	4	2	1	4	..	1	1	1	1	1	2	1	1	..	..	..
40	24	..	..	..	2	3	3	2	2	1	2	..	..	1	3	2	1	2	2	1	..	..	..
41	23	..	..	..	1	4	2	2	2	1	1	2	..	1	3	2	1	2	2	1	..	..	..
42	24	..	..	3	..	2	2	2	2	1	2	2	..	1	3	2	1	2	2	1	..	..	..
43	23	..	..	1	..	..	..	..	..	1	1	2	2	3	..	1	1	1	1	1	..	..	..
44	17	..	..	..	2	4	2	..	..	1	2	3	2	4	1	1	3	2	..	1	..	..	..
45	26	1	..	..	1	1	1	3	1	2	1	3	4	..	1	3	1	2	..	..	3 ¹	..	..
46	23	..	2	..	1	..	..	..	..	..	1	3	..	1	1	1	1	1	..	..	..	..	..
47	24	..	..	..	..	..	..	..	..	2	..	3	3	3	1	1	1	3	2	2	..	..	..
48	24	..	1	..	..	..	..	..	..	1	..	2	4	1	1	1	1	1	1	1	1	1	1
49	26	..	1	..	2	1	4 ¹	1	2	..	3	2	2	1	1	1	3	1	1	2	1	3	3
50	18	..	1	..	..	..	..	..	..	..	..	1	1	1	..	..	3	1	1	3	1	1	1
51	21	..	..	..	..	..	..	..	1	..	1	2	2	..	..	..	3	1	1	1	1	1	1
52	28	..	..	..	1	1	..	1	..	2	2	1	2	1	1	1	1	1	2	2	2	1	1

N. B.—Index figure indicates number of pairs of twins included in total number to which it is affixed.

TABLE 184—NUMBER OF WIDOWERS AND DIVORCEES REPORTING CHILDREN, AND A CLASSIFICATION BY AGE OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY

Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF WIDOWER OR DIVORCEE	Number With Children	NUMBER AND AGES OF YOUNGEST CHILDREN—LAST BIRTHDAY																					
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
53	29	1	..	..	..	..	1	..	..	2	..	4	4	4	1	2	..	1	1	1	4	1	6
54	36	..	..	..	..	1	1	1	1	3	1	2	2	4	3	2	2	4	..	..	..	..	9
55	20	..	..	..	..	1	1	1	1	2	2	3	..	4	2	..	..	2	5 ¹	1	2	1	9
56	21	..	..	1	1	..	..	..	..	..	..	..	..	2	1	1	..	2	4 ¹	1	..	..	7
57	24	..	1	1	..	..	..	..	..	..	1	1	2	2	..	..	1	..	4	1	4	1	7
58	16	..	..	..	..	..	..	1	1	..	..	..	..	1	1	1	..	1	1	1	1	1	7
59	23	..	1	..	..	..	..	1	..	..	2	..	..	2	..	1	1	1	1	2	..	..	11
60	15	..	..	..	..	..	..	..	..	..	..	1	2	1	..	1	..	1	1	..	..	..	10
61	17	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..	1	1	1	1	10
62	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	1	1	3	6
63	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	2	2	6
64	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	1	5
65	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	5
66	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	3 ¹	..	5
67	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	5
68	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
69	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	3
70	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
71	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
72	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
73	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total.....	737	7	19 ¹	16	28	22	47 ²	33	39	21	40	39	40	36	26	24	20	30	28 ³	27	25 ²	23	154

N. B.—Index figure indicates number of pairs of twins included in total number to which it is affixed.

PROPORTION OF EMPLOYEES WITH CHILDREN

The probability of an employee or pensioner leaving children to become eligible for pension after his death must be considered before dealing with the ages and the number of such children. If the probable proportion of those dying who leave children below age eighteen—the maximum age limit for children pensions—be developed and then combined with the probability of death, the result will be the probability of the employee leaving at his death children below eighteen years of age. If the employee leave both a widow and children, the children are not eligible for pension unless the mother dies or otherwise becomes removed from the pension roll before they reach the age of eighteen, consequently this contingency must be provided for by considering the probability of her leaving the pension roll between the time of her husband's death and the time when all her children have attained the age of eighteen.

The proportion of employees dying at any one age, who leave children within the pensionable age, has been developed in past valuations of children's benefits, from tables based on all children (similar in form to tables 179 to 181) by methods equivalent to dividing the total number of children reported as being within the age limits of eligibility, by the total number of married men who report children of any age, thus obtaining a ratio. This ratio, which was never used as greater than unity, when multiplied by the proportion that married men with children form of all married men, and then by the proportion that married men represent of all employees, gave the proportion used.

Such a proportion tends to overstate the true value because, for ages at which the number of children within the age of eligibility exceeds the number of married men having children, it could be correct only in case each of the men had at least one child within the age of eligibility, whereas for ages at which the number of children within the age of eligibility is the same as or less than the number of married men having children, it could be correct only in case no two children within the age of eligibility were in the same family. These conditions can hardly be assumed to exist. Had the tabulations dealt only with the youngest child in each family the proportions would have been correct, but because of the absence of such tabulations it was doubtless expedient at that time to use the earlier method. The data collected by the Commission were so secured and so developed by the use of mechanical devices that tables for all children and for youngest children could each be prepared without undue expense. The values have, as previously stated, been developed from the tabulations dealing with the youngest child.

The ease of tabulation made possible, too, the distinction between the families of husbands and those of widowers and divorcees. Data for these two classes have been developed separately.

The Pension Commission developed directly a single proportion to replace the first two factors employed in the previous methods. A specific example of the method followed in developing from the data the unadjusted proportions which were subsequently graduated is shown below. The figures showing the number of fathers are taken from table 180, on

page 324, and the number of children from table 183, on page 330, and relate to the husbands at age 40 who have children within the pensionable limits.

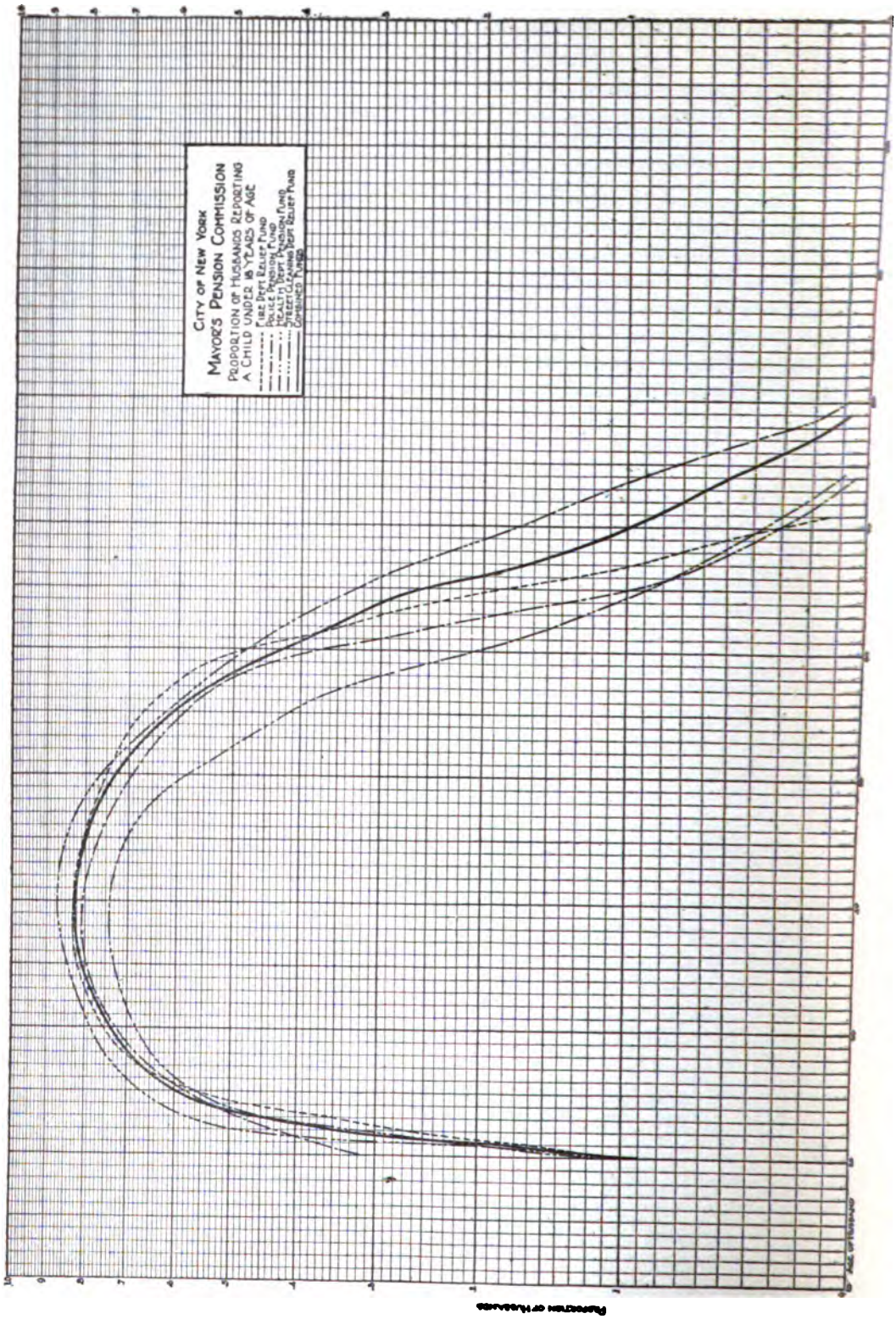
Total youngest children under

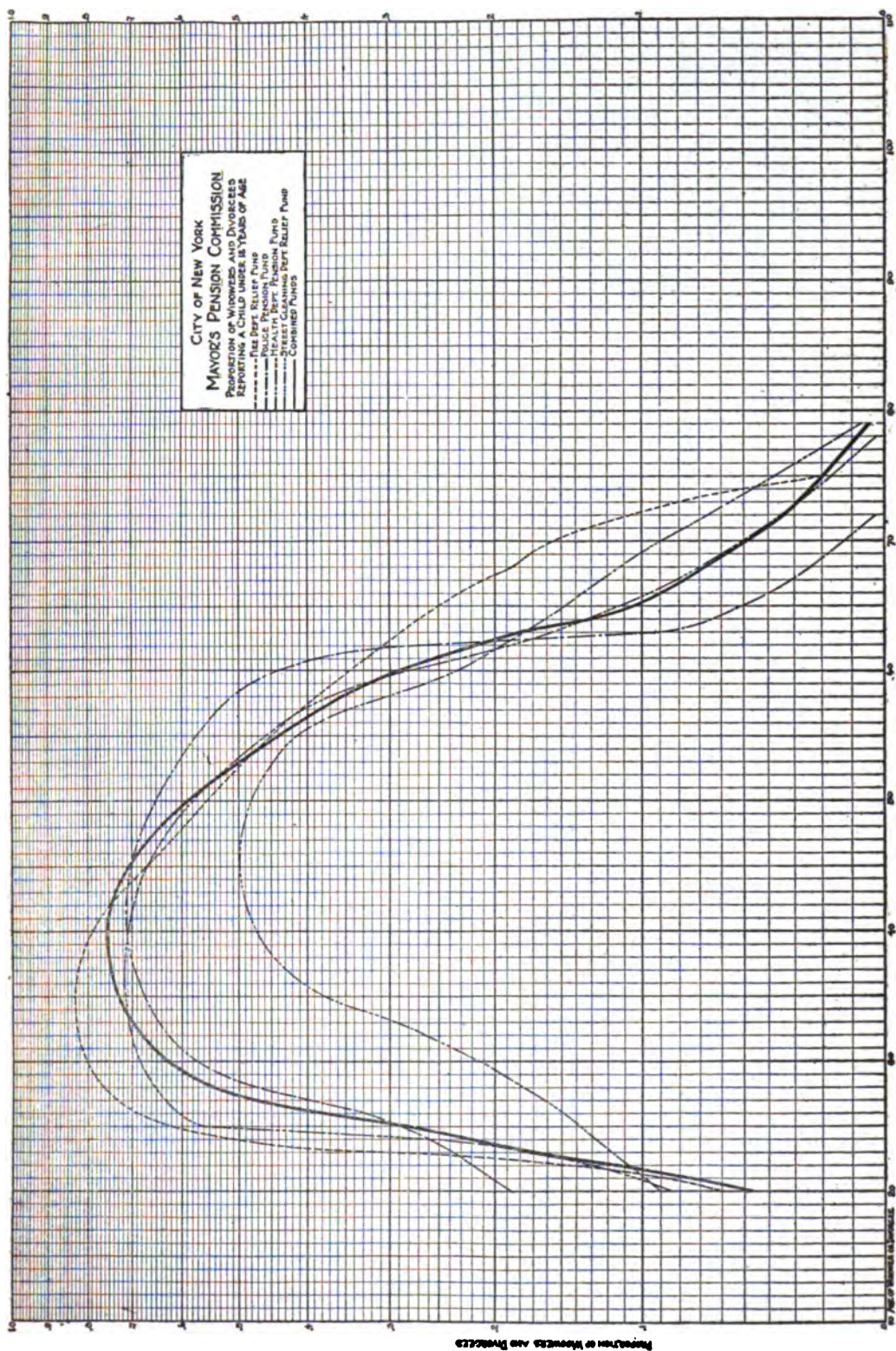
$$18 \text{ years of age} \dots \dots \dots = (66+66+49+55+\dots+2+7+9)=482 \text{ } =.8324$$

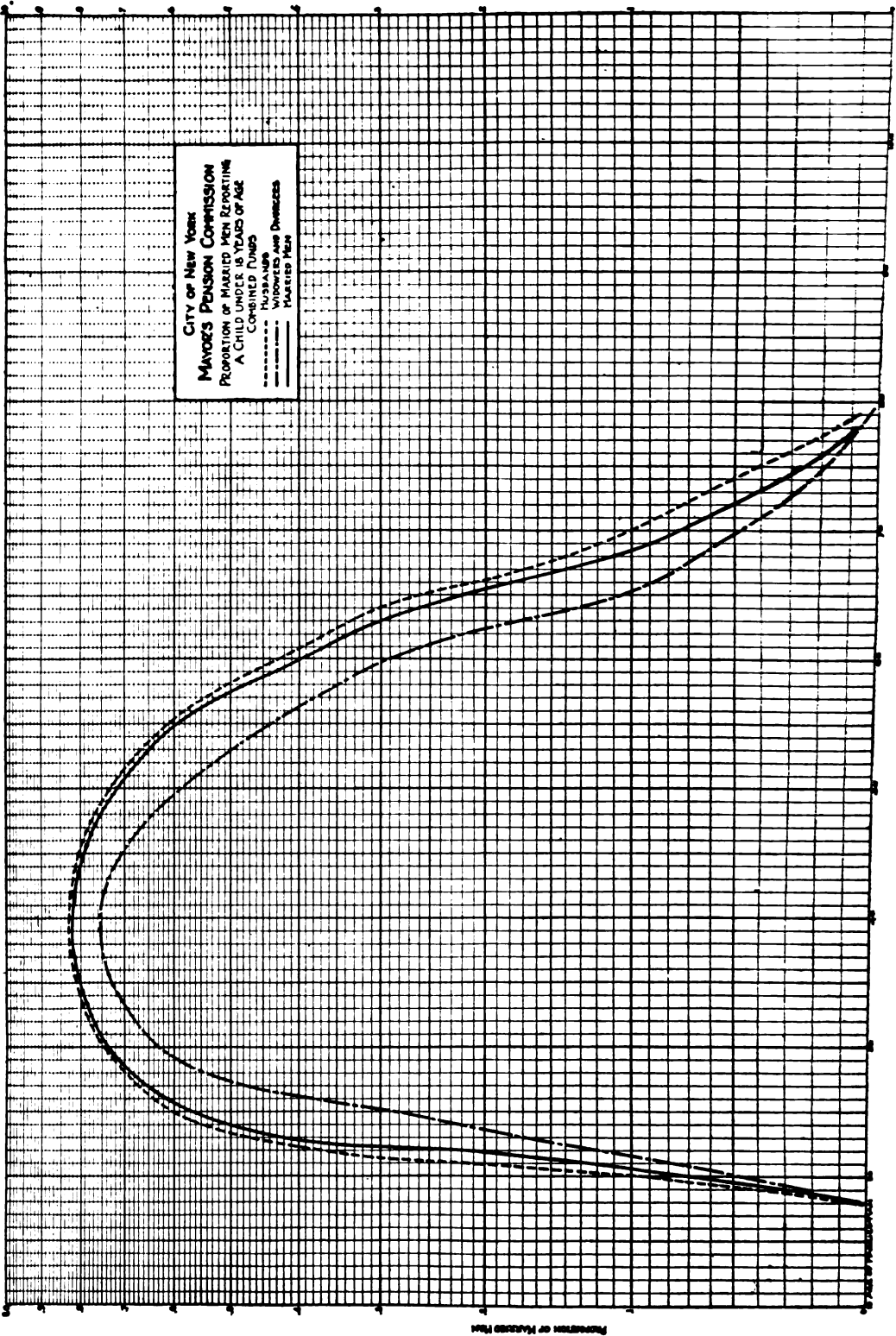
Total husbands=

579

These proportions were developed separately for the four departments and subsequently the data were all combined and a set developed for general use in valuing all children's benefits. The following three diagrams show (1) the proportions for husbands developed from the combined data, together with the specific proportions for the separate departments; (2) similar proportions for widowers and divorcees, and (3) the two curves for the combined services together with a curve based on all the data, irrespective of the marital condition of the father.







The proportions on which the last diagram was based are given in the following table. The symbol pc_z has been employed as a general symbol to cover the probability of a married man having children within the pension limits, an affix being added, as pc_z^h , pc_z^w , to restrict the probability to a specific marital class. The Commission has no other rates of this nature with which comparisons may be made.

TABLE 185—PROPORTION AMONG ALL MARRIED EMPLOYEES LEAVING CHILDREN UNDER EIGHTEEN YEARS OF AGE

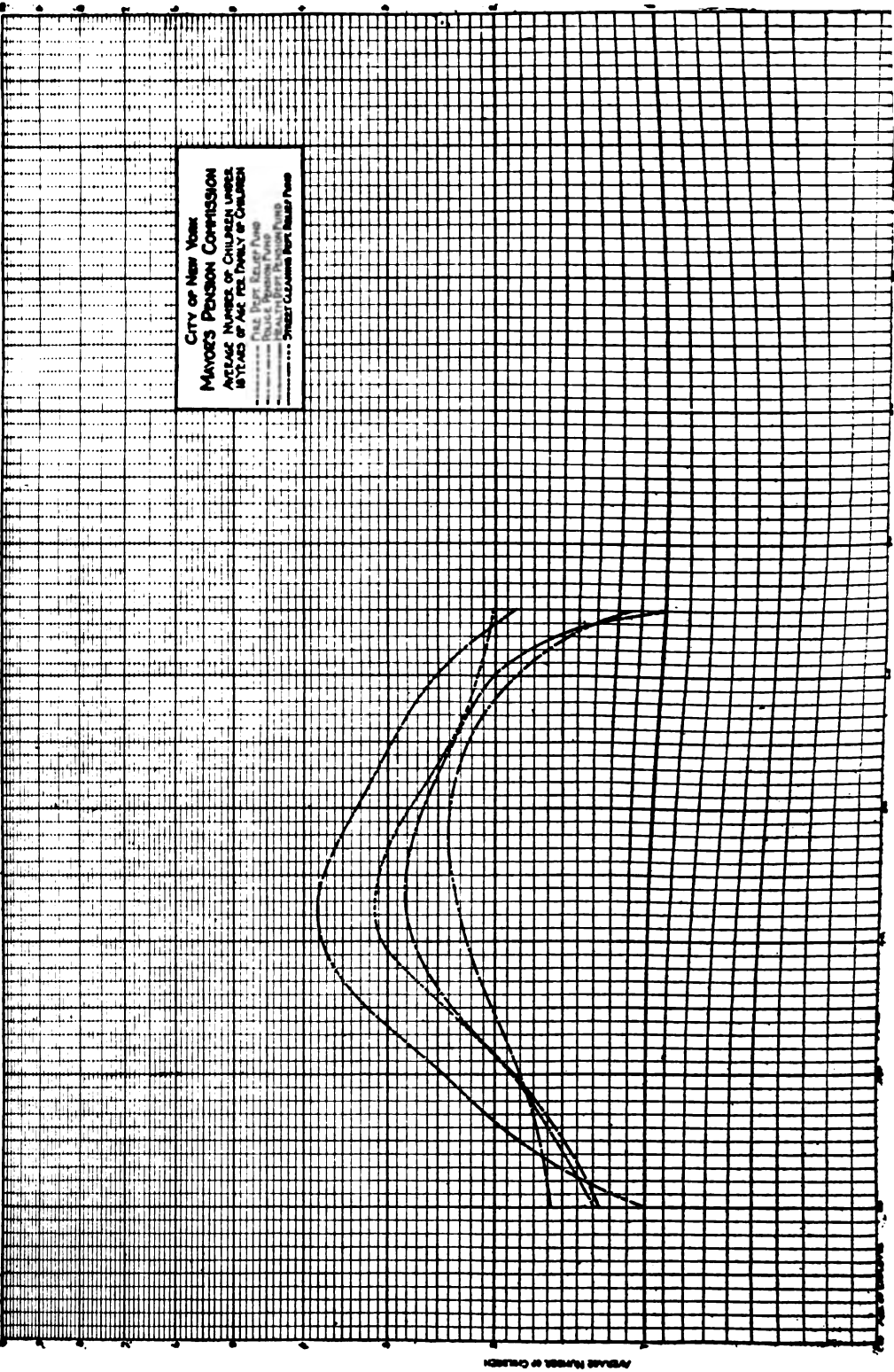
Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF FATHER x	PROPORTION LEAVING CHILDREN UNDER 18 YEARS			AGE OF FATHER x	PROPORTION LEAVING CHILDREN UNDER 18 YEARS		
	Married Men pc_z	Husbands pc_z^h	Widowers or Divorcees pc_z^w		Married Men pc_z	Husbands pc_z^h	Widowers or Divorcees pc_z^w
18	.001	.003	.000	51	.701	.712	.563
19	.033	.037	.022	52	.678	.692	.533
20	.074	.090	.049	53	.653	.667	.503
21	.127	.190	.080	54	.628	.641	.472
22	.215	.358	.120	55	.600	.613	.443
23	.430	.460	.174	56	.565	.580	.413
24	.513	.545	.225	57	.522	.545	.384
25	.572	.600	.285	58	.475	.508	.355
26	.621	.639	.385	59	.437	.467	.325
27	.660	.672	.485	60	.402	.428	.293
28	.693	.700	.550	61	.372	.395	.262
29	.720	.723	.595	62	.339	.363	.225
30	.743	.743	.629	63	.307	.333	.180
31	.761	.761	.658	64	.268	.302	.133
32	.774	.776	.681	65	.225	.258	.103
33	.788	.790	.701	66	.183	.206	.088
34	.798	.800	.716	67	.140	.167	.077
35	.808	.810	.730	68	.111	.139	.067
36	.814	.817	.741	69	.091	.118	.057
37	.819	.823	.749	70	.076	.101	.049
38	.823	.826	.754	71	.063	.085	.041
39	.825	.828	.756	72	.052	.072	.034
40	.825	.827	.756	73	.043	.061	.029
41	.823	.826	.754	74	.034	.050	.024
42	.819	.822	.748	75	.026	.041	.020
43	.814	.817	.740	76	.019	.031	.015
44	.807	.810	.727	77	.012	.023	.012
45	.797	.802	.712	78	.006	.015	.007
46	.786	.792	.693	79	...	.007	.004
47	.774	.782	.672	..	...	...	...
48	.758	.769	.645	..	...	...	...
49	.742	.753	.620	..	...	...	...
50	.722	.733	.591	..	...	...	...

NUMBER OF CHILDREN PER FAMILY

The average number of children per family is not required for use in the valuation of the pensions allowable under existing laws, but such information is of service in determining the amount of pension which should be allowed to provide for the average family of children.

The following chart shows, for each age of the father, the average number of children under eighteen years of age, per family, in the four departments considered. The curves show a rather marked contrast between the sizes of the families of persons in these departments.



The following are the figures upon which the diagram is based. These averages are derived from total figures, that is, for married men, and are of course computed from the tables showing all children. No comparative figures are available for publication with these results.

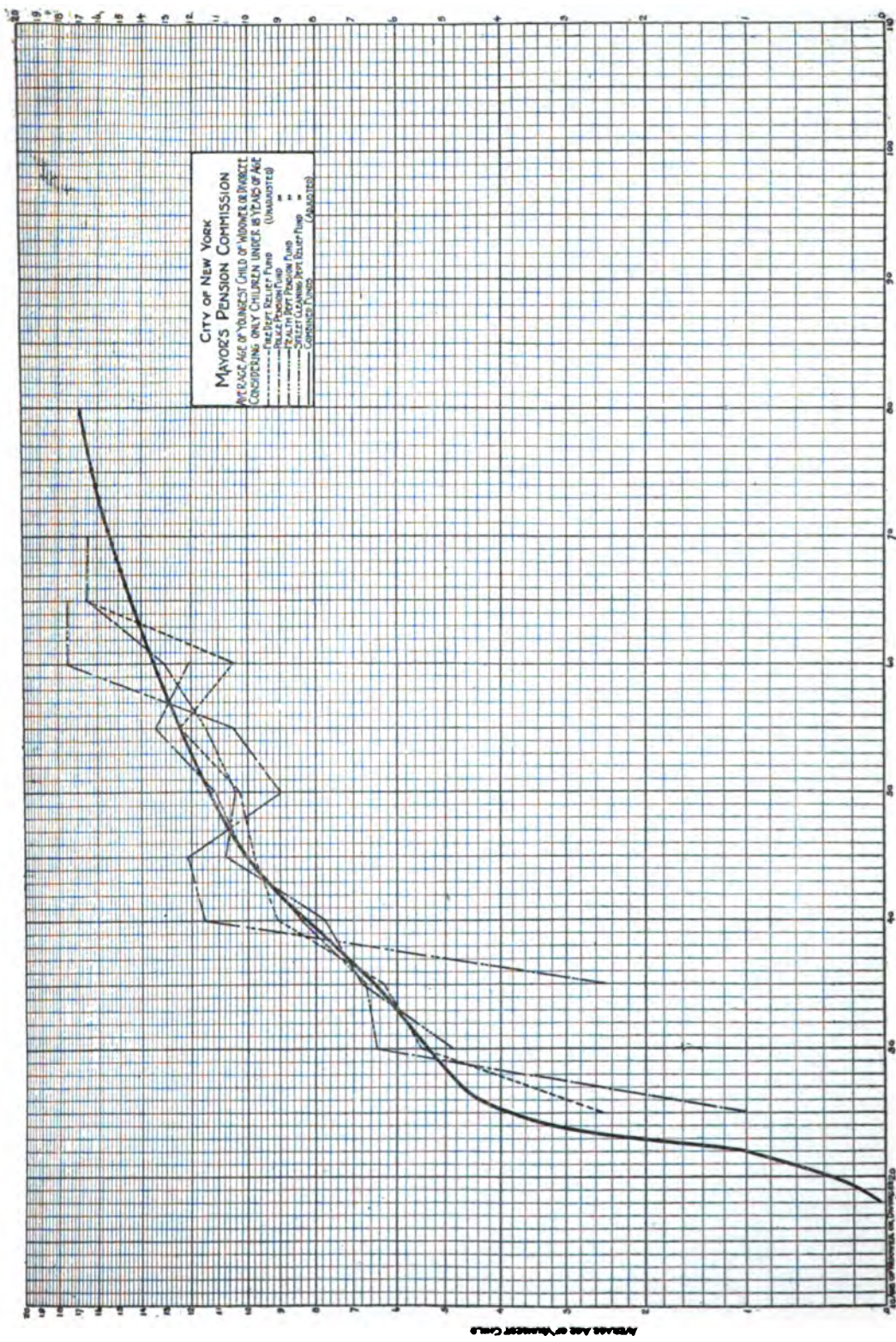
TABLE 186—AVERAGE NUMBER OF CHILDREN UNDER 18 YEARS OF AGE PER FAMILY HAVING CHILDREN

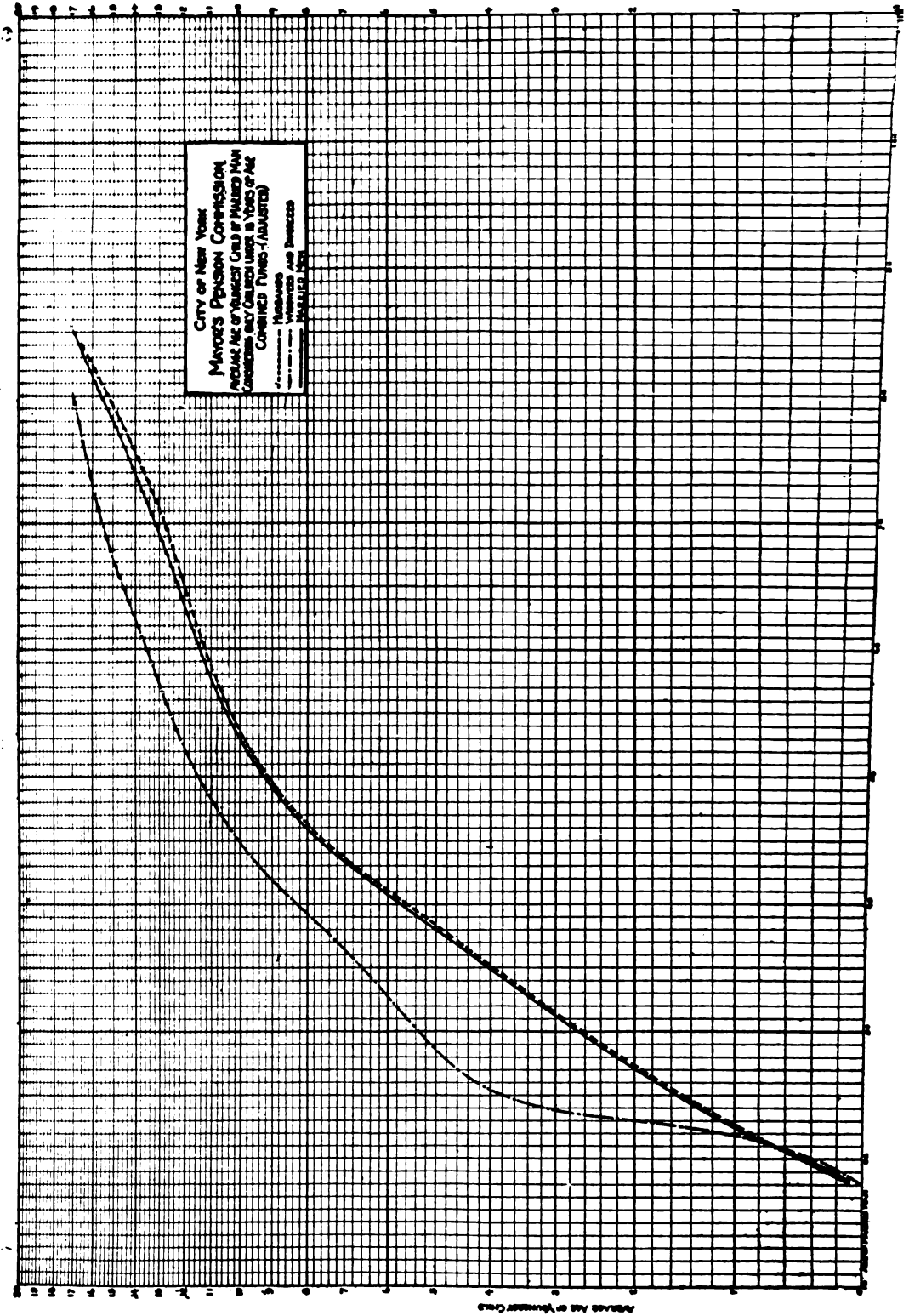
Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF FATHER OF FAMILY	AVERAGE NUMBER OF CHILDREN PER FAMILY				AGE OF FATHER OF FAMILY	AVERAGE NUMBER OF CHILDREN PER FAMILY			
	Dept. of St. Clean. Relief & Pension Fund	Fire Department Relief Fund	Police Pension Fund	Health Department Pension Fund		Dept. of St. Clean. Relief & Pension Fund	Fire Department Relief Fund	Police Pension Fund	Health Department Pension Fund
20	1.00	1.30	1.28	1.59	43	3.82	3.14	2.81	2.35
21	1.16	1.34	1.32	1.60	44	3.79	3.13	2.82	2.37
22	1.32	1.39	1.36	1.62	45	3.74	3.10	2.81	2.39
23	1.49	1.43	1.41	1.64	46	3.69	3.06	2.79	2.41
24	1.66	1.48	1.45	1.65	47	3.62	3.02	2.77	2.42
25	1.83	1.53	1.50	1.67	48	3.53	2.95	2.75	2.43
26	1.98	1.59	1.55	1.70	49	3.44	2.87	2.72	2.42
27	2.11	1.65	1.62	1.72	50	3.35	2.79	2.66	2.40
28	2.24	1.72	1.69	1.74	51	3.27	2.71	2.61	2.37
29	2.35	1.80	1.77	1.77	52	3.19	2.62	2.56	2.35
30	2.46	1.87	1.85	1.80	53	3.12	2.55	2.49	2.33
31	2.59	1.96	1.95	1.84	54	3.04	2.47	2.44	2.28
32	2.74	2.06	2.05	1.87	55	2.96	2.40	2.37	2.24
33	2.88	2.17	2.15	1.92	56	2.89	2.35	2.32	2.18
34	3.05	2.30	2.27	1.97	57	2.82	2.30	2.26	2.13
35	3.24	2.44	2.38	2.03	58	2.74	2.25	2.20	2.05
36	3.40	2.59	2.49	2.07	59	2.65	2.22	2.14	1.96
37	3.55	2.75	2.57	2.13	60	2.56	2.17	2.04	1.86
38	3.65	2.89	2.64	2.16	61	2.45	2.14	1.93	1.76
39	3.73	3.00	2.70	2.21	62	2.33	2.11	1.77	1.64
40	3.78	3.08	2.74	2.25	63	2.18	2.07	1.56	1.51
41	3.82	3.13	2.77	2.29	64	2.02	2.05	1.26	1.34
42	3.83	3.15	2.79	2.33	65	1.85	2.03	1.00	1.17

THE AGE OF YOUNGEST CHILD IN FAMILY

The average age of the youngest child in the family, who is less than eighteen years of age, was computed from the tabulations showing the ages of youngest children only. In preparing the figures the data for fathers within the same five-year groups were combined. The averages were worked for the four departments separately and then compared. The only figures graduated and used in the valuation were those based on the information for all four funds combined. The three following diagrams show (1) the average ages of the youngest children under eighteen years of age of husbands, based on combined data, together with similar unadjusted ages for each of the four departments; (2) similar averages for widowers and divorcees, and (3) the two curves for the combined departments together with a similar curve based on all the data, irrespective of the marital condition of the father.





The following table shows the figures on which the curves in the last chart are based:

TABLE 187—RELATIVE AGE OF YOUNGEST CHILD, UNDER 18 YEARS OF AGE, TO THAT OF FATHER

Police, Fire, Health and Street Cleaning Department Funds Combined

AGE OF FATHER $x + \frac{1}{2}$	AGE OF CHILD			AGE OF FATHER $x + \frac{1}{2}$	AGE OF CHILD		
	Married Men x'	Husbands h_x'	Widowers and Divorcees w_x'		Married Men x'	Husbands h_x'	Widowers and Divorcees w_x'
18½	.21	.22	.08	53½	10.23	10.17	12.17
19½	.40	.42	.26	54½	10.46	10.38	12.39
20½	.61	.62	.53	55½	10.64	10.57	12.60
21½	.81	.82	1.01	56½	10.85	10.75	12.82
22½	1.02	1.03	1.78	57½	11.01	10.92	13.03
23½	1.22	1.21	2.86	58½	11.20	11.08	13.25
24½	1.44	1.44	3.70	59½	11.37	11.22	13.47
25½	1.67	1.66	4.25	60½	11.50	11.38	13.69
26½	1.88	1.88	4.60	61½	11.65	11.50	13.88
27½	2.12	2.10	4.86	62½	11.80	11.62	14.10
28½	2.36	2.33	5.07	63½	11.95	11.78	14.28
29½	2.58	2.56	5.28	64½	12.11	11.91	14.48
30½	2.82	2.80	5.50	65½	12.26	12.06	14.67
31½	3.09	3.03	5.71	66½	12.42	12.20	14.83
32½	3.37	3.29	5.93	67½	12.60	12.37	15.02
33½	3.63	3.55	6.18	68½	12.80	12.52	15.22
34½	3.92	3.83	6.44	69½	12.99	12.70	15.40
35½	4.23	4.11	6.71	70½	13.20	12.91	15.59
36½	4.54	4.42	7.02	71½	13.42	13.11	15.78
37½	4.88	4.75	7.37	72½	13.66	13.32	15.95
38½	5.23	5.10	7.72	73½	13.89	13.52	16.11
39½	5.59	5.48	8.09	74½	14.17	13.77	16.23
40½	5.96	5.86	8.50	75½	14.40	14.00	16.39
41½	6.35	6.25	8.89	76½	14.68	14.28	16.51
42½	6.72	6.61	9.30	77½	14.92	14.55	16.68
43½	7.12	7.02	9.65	78½	15.21	14.84	16.81
44½	7.50	7.41	9.99	79½	15.48	15.17	16.95
45½	7.87	7.80	10.29	80½	15.77	15.48	17.08
46½	8.19	8.14	10.57	81½	16.02	15.81	17.20
47½	8.52	8.49	10.80	82½	16.30	16.18	17.33
48½	8.85	8.82	11.02	83½	16.58	16.48	17.48
49½	9.18	9.13	11.23	84½	16.88	16.83	17.61
50½	9.45	9.41	11.47	85½	17.21	17.19	17.73
51½	9.73	9.69	11.69	86½	17.56	17.52	17.89
52½	9.99	9.92	11.91	87½	17.95	17.90	...

DATA REGARDING EMPLOYEES' DEPENDENT PARENTS

Pensions to dependent parents of employees dying are provided by the four funds. Such benefits are not payable if wife or children survive, and even if there be no such survivors the parent may not be pensioned unless he is considered actually dependent.

The data available for valuing such pensions were extremely meagre but as some estimate of the cost of these benefits was required, it seemed advisable to use the data as being at least indicative of the future rather than to have no basis whatever for an estimate. The reports of pensions to dependent parents were accordingly used as a means of adding facts regarding such parents to the cards for those employees who had died, under conditions which might have given rise to a pension to a dependent parent, and a set of rates were then developed showing the proportion of the employees dying at each age who left parents who were pensioned and the average age of such parents. The following table shows these proportions and average ages which were developed and used in the work. No distinction was made as to whether the pensioned parent was man or woman. However, almost all were women and therefore the pensions of all were valued on the mortality tables applicable to widows.

**TABLE 188—PROPORTION OF ALL EMPLOYEES DYING WHO
LEAVE DEPENDENT PARENTS ELIGIBLE FOR PENSION
WITH THE CORRESPONDING AGE OF SUCH PARENTS**

Police, Fire, Health and Street Cleaning Department Funds Combined

Age of Employee at Death $x+\frac{1}{2}$	Proportion Leav- ing Dependent Parents $pp_z+\frac{1}{2}$	Age of Parent z	Age of Employee at Death $x+\frac{1}{2}$	Proportion Leav- ing Dependent Parents $pp_z+\frac{1}{2}$	Age of Parent z
20½	.10750	52.65	40½	.17575	69.25
21½	.12675	52.87	41½	.22150	69.45
22½	.15750	53.13	42½	.24500	69.85
23½	.23250	53.51	43½	.25300	70.40
24½	.30500	54.07	44½	.25150	71.00
25½	.34500	55.08	45½	.24300	71.75
26½	.36400	57.29	46½	.22450	72.45
27½	.36900	59.30	47½	.19150	73.35
28½	.36200	60.53	48½	.14400	74.40
29½	.34400	61.55	49½	.09800	75.65
30½	.31000	62.58	50½	.06750	77.00
31½	.24800	63.90	51½	.04850	78.75
32½	.18250	65.05	52½	.03565	80.60
33½	.14650	66.35	53½	.02630	82.75
34½	.13050	66.85	54½	.01915	85.35
35½	.12200	67.45	55½	.01365	88.30
36½	.11810	67.58	56½	.00940	91.50
37½	.11845	68.30	57½	.00590	95.25
38½	.12335	68.60	58½	.00290	...
39½	.13675	68.75	...	...	...

MORTALITY TABLES USED IN VALUING ANNUITIES TO DEPENDENTS

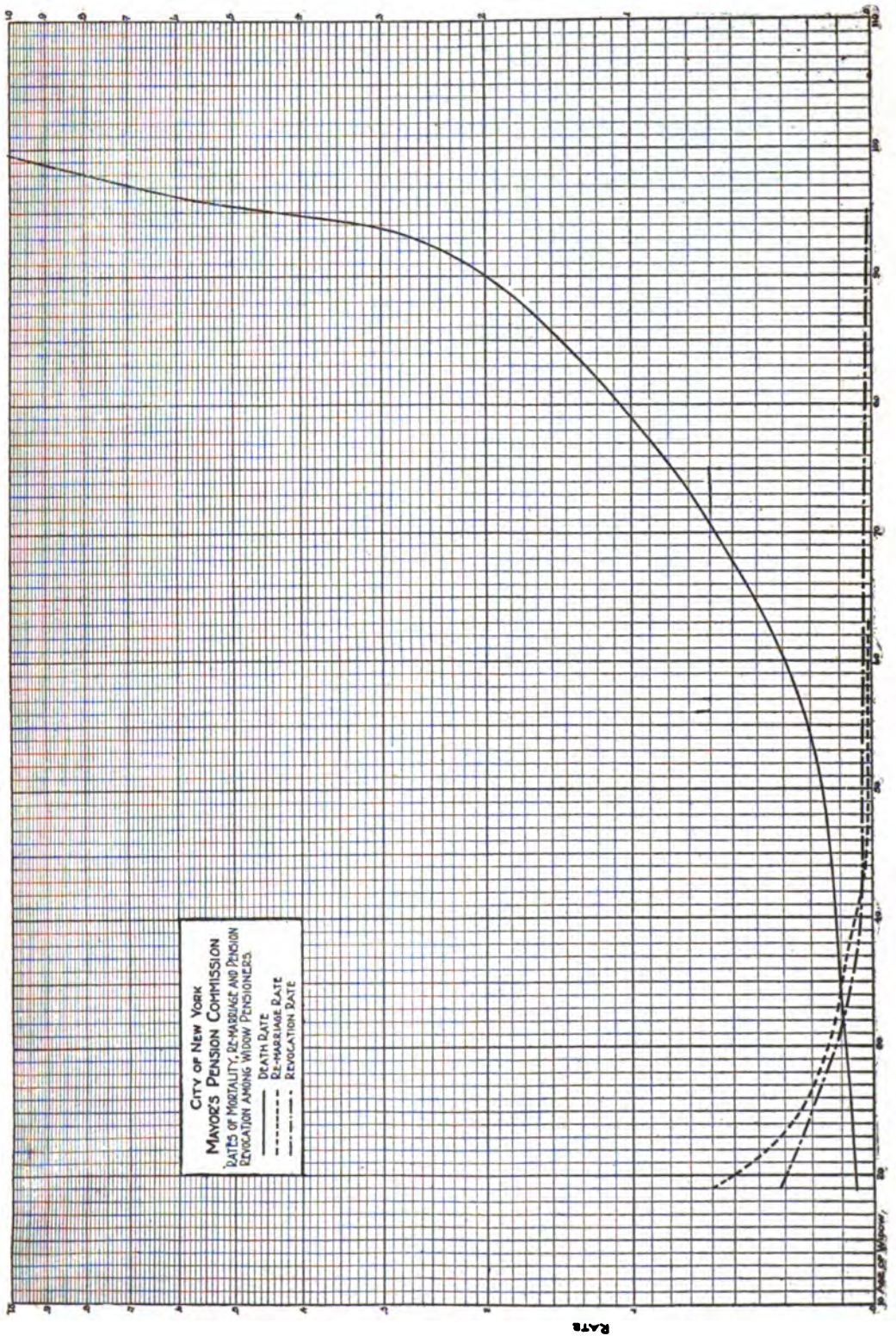
The preceding tables furnish all the necessary family history data for valuing the pension benefits to dependents, excepting those showing the mortality among this class of pensioners. Mortality tables for dependents were prepared by methods similar to those used in developing such tables for other pensioners. The following is a summary of the exposure available.

TABLE 189—SUMMARY OF EXPOSURE—DEPENDENTS

Class	Exposed to Risk	Died	Married and Pensions Revoked
Widows:			
Police Department.....	7,263	209	71
Fire Department.....	3,552	100	21
Health Department.....	58	2	..
Street Cleaning Department.....	120	...	2
Total.....	10,993	311	94
Children:			
Police Department.....	998	4	..
Fire Department.....	571	2	..
Health Department.....	3	...	..
Street Cleaning Department.....	7	...	..
Total.....	1,579	6	..

WIDOWS

The mortality and withdrawal experience of widows on pension was developed separately for the four departments and then combined in a single set of tables applicable to all departments. The following chart shows the rates of separation from the widow's pension roll for each of the three causes—death, remarriage and removal or revocation.



The rates on which the chart is based are given in the following table,

TABLE 190—RATES OF SEPARATION FROM WIDOWS' USED IN THE VALUATION

AGE x	RATE OF DEATH		RATE OF REMARRIAGE		Rate of Revocation New York Funds $r_w q_x$
	New York Funds $d_x^{(w)}$ q_x	Widows of Scottish Bankers (Hewat)	New York Funds $m_w q_x^{(w)}$	Widows of Scottish Bankers (Hewat)	
19	.0066	...	.0604	...	.0320
20	.0068	...	.0523	...	.0300
21	.0069	.0110	.0452	.0001	.0282
22	.0072	.0110	.0385	.0015	.0263
23	.0074	.0111	.0330	.0032	.0245
24	.0077	.0111	.0287	.0051	.0227
25	.0079	.0112	.0257	.0072	.0212
26	.0082	.0112	.0230	.0095	.0194
27	.0084	.0113	.0208	.0120	.0178
28	.0088	.0113	.0189	.0145	.0161
29	.0092	.0114	.0173	.0170	.0142
30	.0095	.0114	.0160	.0195	.0123
31	.0098	.0115	.0148	.0220	.0105
32	.0100	.0115	.0138	.0245	.0080
33	.0102	.0116	.0127	.0270	.0080
34	.0104	.0117	.0118	.0270	.0072
35	.0107	.0118	.0108	.0230	.0066
36	.0109	.0119	.0099	.0195	.0062
37	.0112	.0120	.0088	.0165	.0059
38	.0114	.0121	.0077	.0140	.0057
39	.0117	.0122	.0069	.0115	.0054
40	.0121	.0124	.0062	.0090	.0053
41	.0124	.0126	.0055	.0070	.0052
42	.0127	.0128	.0049	.0050	.0050
43	.0132	.0130	.0045	.0035	.0049
44	.0135	.0132	.0041	.0025	.0048
45	.0138	.0134	.0037	.0018	.0048
46	.0144	.0136	.0034	.0014	.0047
47	.0148	.0138	.0031	.0012	.0047
48	.0154	.0140	.0029	.0011	.0046
49	.0162	.0143	.0027	.0010	.0046
50	.0169	.0147	.0025	.0009	.0046
51	.0176	.0152	.0023	.0008	.0045
52	.0184	.0158	.0022	.0007	.0045
53	.0196	.0165	.0020	.0006	.0045
54	.0206	.0172	.0019	.0005	.0045
55	.0218	.0180	.0018	.0004	.0045
56	.0231	.0188	.0017	.0003	.0044
57	.0246	.0196	.0015	.0002	.0044
58	.0262	.0204	.0014	.0002	.0044
59	.0280	.0212	.0013	.0001	.0043

together with certain comparative rates taken from other experiences:

PENSION ROLL WITH SIMILAR COMPARATIVE RATES OF OTHER FUNDS

AGE x	RATE OF DEATH		RATE OF REMARRIAGE		Rate of Revocation New York Funds $r w q_z^{(w)}$
	New York Funds $q_z^{(w)}$	Widows of Scottish Bankers (Hewat)	New York Funds $w q_z^{(w)}$	Widows of Scottish Bankers (Hewat)	
60	.0299	.0220	.0013	.0001	.0043
61	.0321	.0229	.0012	...	.0043
62	.0343	.0239	.0011	...	.0043
63	.0368	.0250	.0010	...	.0042
64	.0393	.0262	.0009	...	.0042
65	.0419	.0277	.0009	...	.0042
66	.0449	.0296	.0008	...	.0041
67	.0477	.0320	.0007	...	.0041
68	.0508	.0370	.0007	...	.0041
69	.0543	.0420	.0006	...	.0040
70	.0577	.0470	.0005	...	.0040
71	.0618	.0520	.0005	...	.0040
72	.0658	.0570	.0004	...	.0040
73	.0702	.0620	.0003	...	.0039
74	.0748	.0670	.0003	...	.0039
75	.0797	.0720	.0002	...	.0039
76	.0848	.0770	.0002	...	.0038
77	.0899	.0830	.0001	...	.0038
78	.0954	.0890	.0000	...	.0038
79	.1013	.0960	...	...	.0038
80	.1075	.1030	...	...	.0038
81	.1143	.1100	...	...	.0037
82	.1212	.1180	...	...	.0037
83	.1285	.1270	...	...	.0037
84	.1360	.1400	...	...	.0037
85	.1447	.1600	...	...	.0036
86	.1540	.1800	...	...	.0036
87	.1638	.2100	...	...	.0036
88	.1745	.2500	...	...	.0035
89	.1863	.3000	...	...	.0035
90	.2000	.3600	...	...	.0035
91	.2170	.4300	...	...	.0035
92	.2370	.5200	...	...	.0034
93	.2660	.6500	...	...	.0034
94	.3180	.8000	...	...	.0034
95	.4300	1.0000	...	...	.0034
96	.5640	...	...	...	...
97	.6840	...	...	...	...
98	.7950	...	...	...	...
99	.9230	...	...	...	...
100	1.0000	...	...	...	...

The laws governing the four funds provide that widows' pensions may be revoked in the discretion of the pension granting power. The rate shown in the preceding table shows the experience under these laws during the period under observation. Because discretionary action is involved such a rate is subject to frequent variation and as compared with the other rates used for valuation purposes it is probably very unstable. The employment of this particular rate for the valuation of pensions under a system which gives the employees a definite right in the prospective pensions, not contingent upon the exercise of discretionary powers, would be subject to question. Because of these conditions, two mortality and withdrawal tables have been prepared for the valuation of widows' annuities. One table was prepared by the use of all three rates and the other by the employment of the mortality and marriage rates only. Although the general method used in constructing the first of these tables based on all three rates might have been modified somewhat for use in developing the second based only on the two rates, in order to give greater precision, nevertheless the method was employed without change, since the resulting annuity values were more conservative than those which would have been obtained by the modification. The second table was used throughout in the valuation of prospective pensions and of pensions now in force. Pensions now in force were valued by means of the first table also, but the results are not included in this report. The second table was considered more conservative for use in valuing prospective pensions, since any changes in the pension rules regarding widows' pensions may be expected to restrict rather than to broaden the discretionary power of revocation. The following tables were employed in the valuation work:

TABLE 191—WIDOWS MORTALITY TABLE—COMBINED
EXPERIENCE

Police, Fire, Health and Street Cleaning Department Funds

(Table I)

Age	Living $l_z^{(ww)}$	Deaths $d_z^{(ww)}$	Revocations Causes Other Than Remarriage $o_z^{(ww)}$	Re- marriages $m_z^{(ww)}$	Age	Living $l_z^{(ww)}$	Deaths $d_z^{(ww)}$	Revocations Causes Other Than Remarriage $o_z^{(ww)}$	Re- marriages $m_z^{(ww)}$
19	10,000	66	320	604	59	2,214	62	9	3
20	9,010	62	270	471	60	2,140	64	9	3
21	8,207	57	231	371	61	2,064	66	9	3
22	7,548	54	198	291	62	1,986	68	8	2
23	7,005	52	172	231	63	1,908	70	8	2
24	6,550	50	149	188	64	1,828	72	8	2
25	6,163	49	131	158	65	1,746	73	7	1
26	5,825	48	113	134	66	1,665	75	7	1
27	5,530	46	98	115	67	1,582	75	7	1
28	5,271	46	85	100	68	1,499	76	6	1
29	5,040	46	72	87	69	1,416	77	6	1
30	4,835	46	60	77	70	1,332	77	5	1
31	4,652	45	49	69	71	1,249	77	5	1
32	4,489	45	40	62	72	1,166	77	5	..
33	4,342	44	35	55	73	1,084	76	4	..
34	4,208	44	30	50	74	1,004	75	4	..
35	4,084	44	27	44	75	925	74	4	..
36	3,969	43	25	39	76	847	72	3	..
37	3,862	43	23	34	77	772	70	3	..
38	3,762	43	21	29	78	699	67	2	..
39	3,669	43	20	25	79	630	64	2	..
40	3,581	43	19	23	80	564	61	2	..
41	3,496	43	18	19	81	501	57	2	..
42	3,416	43	18	17	82	442	53	2	..
43	3,338	44	16	15	83	387	50	1	..
44	3,263	44	16	13	84	336	46	1	..
45	3,190	44	15	12	85	289	42	1	..
46	3,119	45	15	11	86	246	38	1	..
47	3,048	45	14	9	87	207	34	1	..
48	2,980	46	14	9	88	172	30	1	..
49	2,911	47	13	8	89	141	26	..	..
50	2,843	48	13	7	90	115	23	..	..
51	2,775	49	13	6	91	92	20	..	..
52	2,707	50	12	6	92	72	17	..	..
53	2,639	52	12	5	93	55	14	..	..
54	2,570	53	11	5	94	41	13	..	..
55	2,501	55	11	4	95	28	12	..	..
56	2,431	56	11	4	96	16	9	..	..
57	2,360	58	10	4	97	7	5	..	..
58	2,288	60	10	4	98	2	2	..	..

TABLE 192—WIDOWS MORTALITY TABLE—COMBINED
EXPERIENCE

Police, Fire, Health and Street Cleaning Department Funds

(Table II)

AGE	Living $l_z^{(w)}$	Deaths $d_z^{(w)}$	Remarriages $m^{(w)}$ w_z	AGE	Living $l_z^{(w)}$	Deaths $d_z^{(w)}$	Remarriages $m^{(w)}$ w_z
19	10,000	66	604	60	3,328	100	4
20	9,330	63	488	61	3,224	103	4
21	8,779	61	397	62	3,117	107	3
22	8,321	60	320	63	3,007	111	3
23	7,941	59	262	64	2,893	114	3
24	7,620	59	219	65	2,776	116	2
25	7,342	58	180	66	2,658	119	2
26	7,095	58	163	67	2,537	121	2
27	6,874	58	143	68	2,414	123	2
28	6,673	58	125	69	2,289	124	1
29	6,490	59	112	70	2,164	125	1
30	6,319	60	101	71	2,038	126	1
31	6,158	60	91	72	1,911	126	1
32	6,007	60	83	73	1,784	125	1
33	5,864	60	74	74	1,658	124	..
34	5,730	60	67	75	1,534	122	..
35	5,603	60	61	76	1,412	120	..
36	5,482	60	54	77	1,292	116	..
37	5,368	60	47	78	1,176	112	..
38	5,261	60	41	79	1,064	108	..
39	5,160	60	36	80	956	103	..
40	5,064	61	31	81	853	97	..
41	4,972	62	27	82	756	92	..
42	4,883	62	24	83	664	85	..
43	4,797	63	21	84	579	79	..
44	4,713	64	19	85	500	72	..
45	4,630	64	17	86	428	66	..
46	4,549	65	16	87	362	59	..
47	4,468	66	14	88	303	53	..
48	4,388	68	13	89	250	47	..
49	4,307	70	12	90	203	41	..
50	4,225	71	11	91	162	35	..
51	4,143	73	10	92	127	30	..
52	4,060	75	9	93	97	26	..
53	3,976	78	8	94	71	23	..
54	3,890	80	7	95	48	21	..
55	3,803	83	7	96	27	15	..
56	3,713	86	6	97	12	8	..
57	3,621	89	6	98	4	3	..
58	3,526	92	5	99	1	1	..
59	3,429	96	5	..	...	...	..

The following table gives the expectation of life and the annuity values based on the preceding tables:

TABLE 193—THE ANNUITY VALUES AND EXPECTATIONS OF PENSION APPLICABLE TO WIDOW PENSIONERS

Computed for Both Widows' Mortality Tables.

AGE	ANNUITY VALUE		EXPECTATION OF PENSION		AGE	ANNUITY VALUE		EXPECTATION OF PENSION	
	PENSION SUBJECT TO TERMINATION BY		PENSION SUBJECT TO TERMINATION BY			PENSION SUBJECT TO TERMINATION BY		PENSION SUBJECT TO TERMINATION BY	
	Death Marriage	Death Marriage Revocation	Death Marriage	Death Marriage Revocation		Death Marriage	Death Marriage Revocation	Death Marriage	Death Marriage Revocation
19	13.355	10.588	27.425	20.194	59	10.592	10.219	15.280	14.611
20	13.829	11.145	28.359	21.358	60	10.314	9.960	14.728	14.103
21	14.233	11.653	29.107	22.398	61	10.036	9.700	14.187	13.603
22	14.568	12.112	29.682	23.310	62	9.758	9.442	13.657	13.114
23	14.831	12.514	30.078	24.079	63	9.480	9.183	13.138	12.634
24	15.032	12.861	30.323	24.716	64	9.208	8.926	12.636	12.166
25	15.186	13.163	30.454	25.237	65	8.937	8.671	12.148	11.709
26	15.305	13.434	30.496	25.671	66	8.665	8.415	11.665	11.260
27	15.392	13.668	30.461	26.013	67	8.396	8.164	11.197	10.824
28	15.454	13.870	30.363	26.271	68	8.130	7.911	10.742	10.396
29	15.491	14.041	30.205	26.451	69	7.869	7.661	10.302	9.978
30	15.512	14.179	30.009	26.550	70	7.607	7.414	9.868	9.571
31	15.521	14.286	29.781	26.574	71	7.348	7.168	9.447	9.173
32	15.515	14.359	29.517	26.522	72	7.095	6.927	9.042	8.789
33	15.496	14.401	29.224	26.403	73	6.847	6.676	8.650	8.414
34	15.461	14.418	28.896	26.229	74	6.602	6.452	8.269	8.051
35	15.412	14.413	28.540	26.009	75	6.360	6.220	7.897	7.699
36	15.350	14.388	28.159	25.746	76	6.121	5.994	7.536	7.358
37	15.272	14.345	27.746	25.447	77	5.889	5.770	7.190	7.026
38	15.176	14.281	27.300	25.111	78	5.657	5.549	6.849	6.702
39	15.062	14.197	26.825	24.736	79	5.427	5.329	6.518	6.385
40	14.931	14.095	26.324	24.333	80	5.203	5.112	6.198	6.076
41	14.786	13.980	25.802	23.907	81	4.983	4.897	5.886	5.774
42	14.628	13.850	25.263	23.460	82	4.761	4.685	5.577	5.481
43	14.457	13.705	24.707	22.991	83	4.544	4.474	5.280	5.192
44	14.274	13.551	24.138	22.511	84	4.324	4.263	4.982	4.906
45	14.081	13.384	23.562	22.015	85	4.105	4.047	4.690	4.621
46	13.876	13.205	22.973	21.383	86	3.881	3.832	4.395	4.338
47	13.663	13.018	22.380	20.490	87	3.658	3.614	4.105	4.057
48	13.440	12.819	21.779	20.464	88	3.420	3.390	3.807	3.773
49	13.210	12.613	21.179	19.932	89	3.182	3.157	3.508	3.482
50	12.975	12.400	20.580	19.400	90	2.935	2.911	3.204	3.180
51	12.731	12.180	19.978	18.864	91	2.671	2.649	2.889	2.867
52	12.480	11.952	19.376	18.324	92	2.384	2.365	2.547	2.534
53	12.223	11.717	18.775	17.783	93	2.061	2.052	2.180	2.175
54	11.961	11.478	18.179	16.746	94	1.719	1.710	1.796	1.793
55	11.692	11.233	17.583	16.710	95	1.371	1.352	1.417	1.403
56	11.422	10.985	16.997	16.178	96	1.103	1.068	1.130	1.099
57	11.148	10.732	16.417	15.649	97	.907	.861	.917	.879
58	10.872	10.477	15.845	15.126	98	.722	.678	.750	.690

CHILDREN

The experience covering children's mortality was so limited that it seemed advisable to adopt rates from another experience. The data available were in fact hardly sufficient even to indicate the form of the curve which would reflect the future trend, consequently the rates from various tables considered for adoption were multiplied into the exposed to risk column and the expected deaths thus obtained checked in total with the

actual deaths. A table developed by Archibald Hewat from the experience of Scottish Ministers' Widows' and Orphans' Fund of Scotland, was finally adopted. Although the number of children on the pension rolls of the Ministers' Fund was not so large as the number on the New York roll, the period of observation was very much longer. The expected deaths by use of the adopted rates accumulated to 5.7 while the actual number recorded was 6. Because of this close agreement between the two experiences the use of the adopted table seemed advisable until such time as the entire experience of the children's pension roll could be compiled. The following table contains certain values taken from Mr. Hewat's table as it appears in his account of the valuation of the Scottish Ministers' Widows' and Orphans' Fund. A column has been added to show the term life annuity values based on this table, which have been employed in the valuation work.

**TABLE 194—CHILDREN PENSIONERS' MORTALITY TABLE
WITH THE ADDITION OF THE RATE OF DEATH AND
TERM ANNUITY VALUES**

Age x	Number Living $l_x^{(c)}$	Number Dying $d_x^{(c)}$	Death Rate $q_x^{(c)}$	Term Annuity $\bar{a}_x \frac{1}{18-x}$
0	1,000,000	61,933	.0619	11.548
1	938,067	14,720	.0157	11.748
2	923,347	8,705	.0095	11.384
3	914,642	7,668	.0084	10.928
4	906,974	7,015	.0077	10.436
5	899,959	6,120	.0068	9.914
6	893,839	5,184	.0058	9.358
7	888,655	4,265	.0048	8.766
8	884,390	3,802	.0044	8.138
9	880,498	3,609	.0041	7.479
10	876,889	3,508	.0040	6.788
11	873,381	3,057	.0035	6.066
12	870,324	2,437	.0028	5.309
13	867,887	1,909	.0022	4.515
14	865,978	1,559	.0018	3.685
15	864,419	1,988	.0023	2.818
16	862,431	2,932	.0034	1.916
17	859,499	4,814	.0056	.978

DEPENDENT PARENTS

The mortality of dependent parents was considered as being the same as that of widows at corresponding ages.

DERIVATION OF MONETARY VALUES FOR USE IN VALUATION

The basic tables required in deriving the monetary values for pensions to dependents have all been given; there only remains to be shown the methods of combining values from these tables used in the actual calculations. In the presentation of these methods the benefits to each class of dependents have been considered separately in order to avoid confusion. Certain general values which were used more or less frequently in the work and which are of general use are included in the discussion.

WIDOWS

The survivorship or reversionary benefits to the widows of pensioners now on the rolls, who are husbands, might have been valued by means of joint life tables if the exact ages of the members and their wives had been available,* but such a procedure could not be directly used for valuing prospective pensions to those employees now in the active force who are unmarried. Because of this fact another method was employed uniformly in valuing all widow's benefits.

- (A) The present value in respect to a regular or service pensioner now on the roll at age x , of a pension of one to his widow, was developed as follows:

$l_x^{(p)}$ = number living at age x , according to the regular pensioners' table.

$d_x^{(p)}$ = number dying between the ages of x and $x + 1$ according to the same table.

y = exact age of wife left by husband dying between the ages of x and $x + 1$.

$\bar{a}_y^{(w)}$ = continuous annuity on life of widow at age y terminable on death or remarriage.

pm_x^h = proportion of employees or pensioners at age x , who are husbands.

The symbol " ω " will be used throughout to indicate the highest age shown in the table being considered.

$${}^w\bar{C}_x^{(p)} = d_x^{(p)} \cdot v^{x+1} \cdot pm_{x+1}^h \cdot \bar{a}_y^{(w)}$$

$${}^w\bar{M}_x^{(p)} = \sum_{x=\omega}^{\infty} {}^w\bar{C}_x^{(p)}$$

$$D_x^{(p)} = l_x^{(p)} \cdot v^x$$

$$\frac{{}^w\bar{M}_x^{(p)}}{D_x^{(p)}} = \text{present value of annuity of one to widow.}$$

$$\therefore \frac{{}^w\bar{M}_x^{(p)}}{D_x^{(p)}} \left[\begin{array}{c} \text{Number of regular} \\ \text{pensioners on the} \\ \text{roll at age } x \end{array} \right] \left[\begin{array}{c} \text{Average amount of} \\ \text{pension payable} \\ \text{to widow} \end{array} \right]$$

= present value of future pensions to widows of regular pensioners now on the roll at age x .

Similarly the value

$$\frac{{}^w\bar{M}_x^{(i)}}{D_x^{(i)}}$$

was developed for use in valuing pensions to the widows of disability pensioners now on the roll.

* The records of the marital condition of members on pension were not used as a basis for other than study figures, as these records are not always corrected to date.

- (B) The present value in respect to an active employee at age x , of a pension of one to his widow, should he be killed in actual performance of duty, was developed as follows :

$l_x^{(a)}$ = number living at age x , according to the active service table.

${}^a d_x^{(a)}$ = number of active employees dying in actual performance of duty between the ages of x and $x + 1$, according to the active service table.

$${}^a w \bar{C}_x^{(a)} = {}^a d_x^{(a)} \cdot v^{x+1} \cdot pm_{x+1} \cdot \bar{a}_v^{(a)}$$

$${}^a w \bar{M}_x^{(a)} = \sum_{t=x}^{\infty} {}^a w \bar{C}_t^{(a)}$$

$$D_x^{(a)} = l_x^{(a)} \cdot v^x$$

$$\frac{{}^a w \bar{M}_x^{(a)}}{D_x^{(a)}} = \text{present value of annuity of one to widow.}$$

$$\therefore \frac{{}^a w \bar{M}_x^{(a)}}{D_x^{(a)}} \left[\begin{array}{c} \text{Number of active} \\ \text{employees in the} \\ \text{force at age } x \end{array} \right] \left[\begin{array}{c} \text{Average amount} \\ \text{of pension pay-} \\ \text{able to widow} \end{array} \right]$$

= present value of future pensions to widows of members now in the active force at age x who will be killed in the actual performance of duty.

Similarly by use of the ${}^a d_x^{(a)}$ column instead of the ${}^a d_x^{(a)}$ column, a value may be developed covering deaths which occur in active service from causes not having their origin in the actual performance of duty. This value developed similarly on a basis of one would be

$$\frac{{}^a w \bar{M}_x^{(a)}}{D_x^{(a)}}$$

Attention is called to the fact that these columnar values and the succeeding columnar values derived in this section of the report may be handled as are similar commutation columns based on ordinary life tables. For example, if the widow were pensionable only in case her husband died in actual performance of duty, and in case the husband died from other causes, only after he had had ten years' service, then the value for an employee at age x who had had three years of service would be

$$\frac{{}^a w \bar{M}_x^{(a)} + {}^a w \bar{M}_{x+7}^{(a)}}{D_x^{(a)}}$$

- (C) The preceding illustrations show the general type of calculations required with the exception of that to determine the value in respect to a member now in the active force at age x , of a pension of one to his widow if he die after leaving the active service on pension. Disability pensions and regular pensions require separate development. The value for disability pensions was derived as follows:

$r_n^{(a)}$ = number of disability retirements of active employees between the ages of x and $x + 1$.

$${}^w\bar{C}_x^{(a)} = r_n^{(a)} \cdot v^{x+1/2} \cdot \frac{1}{2} \left(\frac{{}^w\bar{M}_x^{(i)}}{D_x^{(i)}} + \frac{{}^w\bar{M}_{x+1}^{(i)}}{D_{x+1}^{(i)}} \right)$$

$${}^w\bar{M}_x^{(a)} = \sum_{n=x}^{\infty} {}^w\bar{C}_n^{(a)}.$$

$$\frac{{}^w\bar{M}_x^{(a)}}{D_x^{(a)}} = \text{present value of annuity of one to the widow.}$$

$$\therefore \frac{{}^w\bar{M}_x^{(a)}}{D_x^{(a)}} \left[\begin{array}{c} \text{Number of employees} \\ \text{in the active force} \\ \text{at age } x \end{array} \right] \left[\begin{array}{c} \text{Average amount of} \\ \text{pension payable} \\ \text{to widow} \end{array} \right]$$

= present value of future pensions to widows of members now in the active service at age x who will die after being retired on disability pensions.

A similar formula may be applied in developing the values of the pensions to the prospective widows of employees now on the active rolls who will die as regular or service pensioners, but the formula is applicable only if the pension plan provides the same benefit for the widows of persons dying on the pension rolls as it gives to widows of persons dying in the active service, and if it is unnecessary to state separately the value of the pensions to the two classes of widows. If the pension plan allow a larger benefit to one class than to the other, or if for any reason the values of the pensions to the two classes must be accurately stated separately, further refinement is necessary in the formula. As has been explained at length on page 36, it seems advisable, in order to secure greater accuracy in deriving rates of retirement on regular or service pensions, to assume that certain persons, who were shown by the actual experience tables to have retired on regular or service pensions, remained in the active service until a later age. The deaths that occurred among this group thus treated were, however, regarded as deaths of persons on pension, since as the benefits to the two classes of widows were the same it made no difference in the result. Had the benefits been different, the correct number of deaths would have to be deducted from deaths of persons on pension and added to the deaths in the active service. The formulæ throughout must of course be consistent with the provisions of the fund.

Because of their general application in the development of the formulæ presented above the tabular values of $\bar{a}_v^{(w)}$ and $(v^{x+1/2} \cdot pm_{x+1/2}^h \cdot \bar{a}_v^{(w)})$ for each age of the husband are given.

**TABLE 195—CERTAIN TABULAR VALUES USED IN THE
VALUATION OF WIDOWS' BENEFITS**

Age of Husband $x + \frac{1}{2}$	$\bar{a}^{(w)}_x$	$[p^{x+\frac{1}{2}} \cdot pm^{x+\frac{1}{2}} \cdot \bar{a}^{(w)}_x]$	Age of Husband $x + \frac{1}{2}$	$\bar{a}^{(w)}_x$	$[p^{x+\frac{1}{2}} \cdot pm^{x+\frac{1}{2}} \cdot \bar{a}^{(w)}_x]$
19½	13.940	...	60½	11.830	.87997
20½	14.100	.42278	61½	11.590	.81904
21½	14.260	.70506	62½	11.355	.76230
22½	14.400	1.09660	63½	11.125	.71702
23½	14.560	1.52694	64½	10.900	.65542
24½	14.680	1.90739	65½	10.650	.60475
25½	14.825	2.25322	66½	10.390	.55539
26½	14.950	2.52588	67½	10.150	.50796
27½	15.060	2.75851	68½	9.890	.46198
28½	15.150	2.96625	69½	9.650	.42089
29½	15.240	3.11229	70½	9.380	.38175
30½	15.310	3.17668	71½	9.130	.34648
31½	15.360	3.18659	72½	8.870	.31373
32½	15.395	3.17235	73½	8.600	.28319
33½	15.415	3.13819	74½	8.320	.25474
34½	15.425	3.09380	75½	8.060	.22909
35½	15.420	3.03841	76½	7.780	.20529
36½	15.395	2.96868	77½	7.525	.18403
37½	15.365	2.89112	78½	7.260	.16414
38½	15.325	2.80548	79½	6.990	.14571
39½	15.265	2.71300	80½	6.730	.12888
40½	15.180	2.61505	81½	6.480	.11356
41½	15.100	2.51650	82½	6.215	.09925
42½	15.000	2.41529	83½	5.960	.08642
43½	14.890	2.31429	84½	5.690	.07461
44½	14.765	2.21265	85½	5.440	.06400
45½	14.640	2.11347	86½	5.190	.05419
46½	14.510	2.01637	87½	4.960	.04568
47½	14.350	1.91811	88½	4.725	.03804
48½	14.200	1.82399	89½	4.500	.03125
49½	14.050	1.73299	90½	4.280	.02551
50½	13.870	1.64136	91½	4.080	.02079
51½	13.690	1.55331	92½	3.870	.01675
52½	13.490	1.46589	93½	3.680	.01339
53½	13.315	1.38412	94½	3.500	.01044
54½	13.120	1.30373	95½	3.300	.00748
55½	12.925	1.22689	96½	3.130	.00547
56½	12.725	1.15291	97½	2.960	.00365
57½	12.505	1.08035	98½	2.790	.00208
58½	12.290	1.01127	99½	2.640	.00072
59½	12.060	.94402	...	...	...

CHILDREN

The valuation of pension benefits to children, though representing the smallest liability for any one class of pensioners, with the exception of dependent parents, involved the greatest amount of labor. Such values involve not only all the probabilities required for valuing employees' pensions, and all those employed in the valuation of widows' pensions, but in addition all the probabilities which must be considered regarding the chances of issue and the ages and number of the children at the moment of death. Considering the same classes of employee pensioners and of active members, as were discussed in regard to widows' benefits we may develop the values of children's pensions.

- (D) The present value in respect to a regular or service pensioner now on the roll at age x , of a pension of one to his children, commencing at his death, if their mother be dead, or on her removal from the pension roll, if she survive him, to continue until all the children have attained age eighteen, was developed as follows:

${}^h x' =$ average age of youngest child of husband dying between the ages of x and $x + 1$.

${}^w x' =$ average age of youngest child of widower dying between the ages of x and $x + 1$.

$pc_x^h =$ proportion of husbands at age x , who have children under age 18.

$pc_x^w =$ proportion of widowers and divorcees at age x , who have children under age 18.

In view of the fact that the average family has more than one child, the assumption has been made that in case the youngest child dies the next older will replace him and so on, so that the term annuities to families of children have been valued as annuities certain.

$18 - {}^h x' =$ term for which annuity might become payable to children of husband.

$18 - {}^w x' =$ term for which annuity might become payable to children of widower or divorcee.

$$\bar{a}_{18-{}^h x'} = \frac{1}{2} + \bar{a}_{18-{}^h x'-\frac{1}{2}}.$$

$$\bar{a}_{18-{}^w x'} = \frac{1}{2} + \bar{a}_{18-{}^w x'-\frac{1}{2}}.$$

${}_{18-{}^h x'} \bar{a}_y^{(w)} = \frac{1}{2} + {}_{18-{}^h x'-\frac{1}{2}} a_y^{(w)} =$ term annuity on wife's life during period $18 - {}^h x'$ after husband's death.

$\bar{a}_{18-{}^h x'} - {}_{18-{}^h x'} \bar{a}_y^{(w)} =$ value of reversionary term annuity of one to children of husband dying.

$l_x^{(p)} =$ number living at age x according to the regular pensioners' table.

$d_x^{(p)} =$ number dying between ages x and $x + 1$ according to the regular pensioners' table.

$\bar{a}_x^{(p)} \cdot v^{\frac{1}{2}} \cdot pm_{x+\frac{1}{2}}^w \cdot pc_{x+\frac{1}{2}}^w \cdot \bar{a}_{18-{}^w x'} =$ present value at age x of annuities to children of widowers dying during the year, out of $l_x^{(p)}$ pensioners living at the beginning of the year.

$d_x^{(p)} \cdot v^t \cdot pm_{x+1}^h \cdot pc_{x+1}^h \cdot [\bar{a}_{18-x} - {}_{18-x}\bar{a}_y^{(w)}]$
 = present value at age x of reversionary term annuities to children of husbands dying during the year, out of $I_x^{(p)}$ pensioners living at the beginning of the year.

$${}^{h+w}r\alpha_{18}\bar{C}_x^{(p)} = d_x^{(p)} \cdot v^{x+1} \cdot [pm_{x+1}^w \cdot pc_{x+1}^w \cdot \bar{a}_{18-x}^{(w)}] \\ + pm_{x+1}^h \cdot pc_{x+1}^h \cdot (\bar{a}_{18-x} - {}_{18-x}\bar{a}_y^{(w)})]$$

$${}^{h+w}r\alpha_{18}\bar{M}_x^{(p)} = \sum_{x=20}^{\infty} {}^{h+w}r\alpha_{18}\bar{C}_x^{(p)}$$

$$D_x^{(p)} = I_x^{(p)} \cdot v^x$$

$$\frac{{}^{h+w}r\alpha_{18}\bar{M}_x^{(p)}}{D_x^{(p)}} = \text{present value of an annuity of one to children}$$

$$\therefore \frac{{}^{h+w}r\alpha_{18}\bar{M}_x^{(p)}}{D_x^{(p)}} \left[\begin{array}{c} \text{Number of regu-} \\ \text{lar pensioners} \\ \text{at age } x \end{array} \right] \left[\begin{array}{c} \text{Average amount of} \\ \text{pension payable} \\ \text{to children} \end{array} \right]$$

= present value of future pensions to children of regular pensioners now on roll at age x .

A similar development gives the values used in regard to disability pensioners.

(E) The present value in respect to an active employee at age x , of a pension of one to his children, commencing on his death in actual performance of duty, if their mother be dead, or on her removal from the pension roll if she survive his accidental death, to continue until all the children have attained age eighteen, was computed as follows:

$I_x^{(a)}$ = number living at age x according to active service table.

${}^a d_x^{(a)}$ = number of active employees dying in actual performance of duty between the ages of x and $x + 1$, according to the active service table.

$${}^{a,h+w}r\alpha_{18}\bar{C}_x^{(a)} = {}^a d_x^{(a)} \cdot v^{x+1} \cdot [pm_{x+1}^w \cdot pc_{x+1}^w \cdot \bar{a}_{18-x}^{(w)}] \\ + pm_{x+1}^h \cdot pc_{x+1}^h \cdot (\bar{a}_{18-x} - {}_{18-x}\bar{a}_y^{(w)})]$$

$${}^{a,h+w}r\alpha_{18}\bar{M}_x^{(a)} = \sum_{x=20}^{\infty} {}^{a,h+w}r\alpha_{18}\bar{C}_x^{(a)}$$

$$D_x^{(a)} = I_x^{(a)} \cdot v^x$$

$$\frac{{}^{a,h+w}r\alpha_{18}\bar{M}_x^{(a)}}{D_x^{(a)}} = \text{present value of an annuity of one to children.}$$

$$\therefore \frac{{}^{a,h+w}r\alpha_{18}\bar{M}_x^{(a)}}{D_x^{(a)}} \left[\begin{array}{c} \text{Number of employees} \\ \text{in the active service} \\ \text{at age } x \end{array} \right] \left[\begin{array}{c} \text{Average amount of} \\ \text{pensions payable} \\ \text{to children} \end{array} \right]$$

= present value of future pensions to children of members now in the active force at age x , who will be killed in performance of duty.

Similar values may be developed on the ${}^o d_x^{(a)}$ column of the active service table. The derived values may be employed in the same manner as those used for widows' benefits and limitations as to the employee's service before death, etc., may be accounted for by similar combinations of the values.

- (F) The preceding values cover the general type of the calculations required, with the exception of the value in respect to a member now in the force at age x , of a pension of one to his children if he die after leaving the active force on pension. Considering the general limitations that the pension to the children is not payable unless both mother and father have been removed from the pension roll, the value covering the employee's death after disability retirement was derived as follows:

${}^i r_x^{(a)}$ = number of disability retirements of active employees between the ages of x and $x + 1$.

$${}^i r_{x+1}^{(a)} r_{(18)} \bar{C}_x^{(a)} = {}^i r_x^{(a)} \cdot v^{x+1} \cdot \frac{1}{2} \left(\frac{{}^{a+x} r_{(18)} \bar{M}_x^{(i)}}{D_x^{(i)}} + \frac{{}^{a+x} r_{(18)} \bar{M}_{x+1}^{(i)}}{D_{x+1}^{(i)}} \right).$$

$${}^i r_{x+1}^{(a)} r_{(18)} \bar{M}_x^{(a)} = \sum_{a=x}^{\infty} {}^i r_{a+1}^{(a)} r_{(18)} \bar{C}_a^{(a)}.$$

$$\frac{{}^i r_{x+1}^{(a)} r_{(18)} \bar{M}_x^{(a)}}{D_x^{(a)}} = \text{present value of an annuity of one to children.}$$

$$\frac{{}^i r_{x+1}^{(a)} r_{(18)} \bar{M}_x^{(a)}}{D_x^{(a)}} \left[\begin{array}{c} \text{Number of employees} \\ \text{in the active force} \\ \text{at age } x \end{array} \right] \left[\begin{array}{c} \text{Average amount of} \\ \text{pension payable} \\ \text{to children} \end{array} \right]$$

= present value of future pensions to children of members now in the active force at age x who will die after being retired on disability pension.

Similar values were developed covering members dying after being retired on regular service pensions. These values are affected by the conditions of retirement in the same manner as are the widows' pension benefits.

Because of their general application in the development of the formulæ presented above, the tabular values of

$$\text{and} \quad [pm_{x+1}^b \cdot pc_{x+1}^b \cdot (\bar{a}_{18-x} - 1) - {}_{18-x} \bar{a}_y]$$

$$[pm_{x+1}^w \cdot pc_{x+1}^w \cdot \bar{a}_{18-x}]$$

for each age of the father are given.

TABLE 196—CERTAIN TABULAR VALUES USED IN THE VALUATION OF CHILDREN'S BENEFITS

Age of Father $x + \frac{1}{2}$	$\left[\frac{pm^h}{a} \cdot \frac{1}{1-s^h} \cdot \frac{pc^h}{s^h} + \frac{1}{2} \cdot \left(\frac{a}{1-s^h} \cdot \frac{1}{1-s^h} \cdot \frac{pc^h}{s^h} \right) \right]$	$\left[\frac{pm^w}{s} + \frac{1}{2} \cdot \frac{pc^w}{a} \cdot \frac{1}{1-s^w} \right]$	Age of Father $x + \frac{1}{2}$	$\left[\frac{pm^h}{a} \cdot \frac{1}{1-s^h} \cdot \frac{pc^h}{s^h} + \frac{1}{2} \cdot \left(\frac{a}{1-s^h} \cdot \frac{1}{1-s^h} \cdot \frac{pc^h}{s^h} \right) \right]$	$\left[\frac{pm^w}{s} + \frac{1}{2} \cdot \frac{pc^w}{a} \cdot \frac{1}{1-s^w} \right]$	$[(b) + (c)] \cdot \frac{1}{s^h} + \frac{1}{2}$
(a)	(b)	(c)	(a)	(b)	(c)	(d)
19½	.01986	.00113	52½	.27428	.26684	.06903
20½	.06700	.00332	53½	.25169	.26048	.06283
21½	.13501	.00387	54½	.22748	.25392	.05678
22½	.23227	.00631	55½	.20758	.24581	.05142
23½	.34532	.00994	56½	.18777	.23634	.04625
24½	.45174	.01530	57½	.17056	.22534	.04151
25½	.55360	.02268	58½	.15425	.21572	.03730
26½	.64107	.03416	59½	.13807	.20095	.03287
27½	.72172	.04519	60½	.12369	.18209	.02850
28½	.79634	.05604	61½	.11106	.15765	.02417
29½	.85085	.07096	62½	.10049	.13195	.02003
30½	.87984	.08768	63½	.08981	.11000	.01678
31½	.89206	.10758	64½	.07924	.08900	.01341
32½	.89349	.12692	65½	.07041	.07449	.01110
33½	.88622	.14862	66½	.05950	.05950	.00909
34½	.86923	.16614	67½	.05158	.05158	.00757
35½	.84211	.18346	68½	.04389	.04784	.00625
36½	.80947	.19887	69½	.03706	.04107	.00522
37½	.77150	.21517	70½	.03102	.03554	.00419
38½	.72921	.23208	71½	.02507	.02975	.00332
39½	.69446	.24079	72½	.02126	.02531	.00271
40½	.65367	.25103	73½	.01765	.02021	.00212
41½	.61354	.26039	74½	.01308	.01637	.00160
42½	.57813	.26620	75½	.01098	.01202	.00124
43½	.53928	.26858	76½	.00901	.00978	.00094
44½	.50729	.27302	77½	.00664	.00728	.00067
45½	.47469	.27562	78½	.00419	.00506	.00043
46½	.44595	.27886	79½	.00377	.00421	.00035
47½	.41338	.27710	80½	.00270	.00330	.00026
48½	.38559	.27802	81½	.00171	.00228	.00016
49½	.35414	.27668	82½	.00081	.00081	.00011
50½	.32677	.27506	83½	.00038	.00038	.00008
51½	.30018	.27203	84½	.00018	.00018	.00004
						.00002
						.00001

DEPENDENT PARENTS

Pensions to dependent parents were valued by the same methods as those used in valuing widows' pensions. The only differences in the formulæ are that the proportion of employees leaving dependent parents was substituted for the proportion who are husbands, and the ages and corresponding annuity values of dependent parents were used in place of the ages of wives.

SECTION IV

**VALUATION OF ALL FUNDS, INCLUDING CERTAIN TABLES
OF RATES AND VALUES FOR COMPARISON BETWEEN
INDIVIDUAL FUNDS**

VALUATION OF ALL FUNDS, INCLUDING CERTAIN TABLES OF RATES AND VALUES FOR COMPARISON BETWEEN INDIVIDUAL FUNDS

The general methods employed in valuing the assets and liabilities of the funds and such facts regarding each individual fund as seemed to require separate consideration have been discussed in the preceding sections of this report. In this section such material is brought together as seems essential for a consideration of the different funds as component parts of a single pension system of the city. The facts relating to a specific fund are, therefore, treated in this section of the report only in so far as they show the relation of that fund to the other funds or to the entire pension system of the municipality. The conditions of service and the pension benefits applicable to the various classes of employees are contrasted and the aggregate assets and liabilities of the entire pension system are presented.

COMPARISON OF MORTALITY AND SERVICE RATES EMPLOYED

In tables 197 to 207 are presented the various rates of separation from the active service and of pensioners' mortality that have been used in the present report, arranged to facilitate comparison between the different funds and branches. The order in which the rates for the several funds have been arranged in the tables has been determined separately for each table, according to the magnitude of the rates, so that the figures for the fund which has the highest total rate from the cause shown occupy the first, or extreme left hand columns and those for the fund with the lowest rate, the last, or extreme right hand column. The method used in determining which total rate was the highest consisted essentially in the application of the rates to a staff used as standard in respect to age and service distributions, as is subsequently explained at greater length.

Aggregate rates are shown in the tables for all funds for which they were developed. In those cases where select and ultimate rates were used instead of an aggregate rate, the ultimate rate and the select rate for the first year are both given. The aggregate rate in such cases would of course lie between the two.

In comparing the rates presented in these tables one must always bear in mind that in a given fund each rate is not absolutely independent of every other rate, but to a certain extent the rates may be mutually dependent. Total rates of withdrawal, total rates of death, and certain of the rates of retirement are probably in general sufficiently independent of other rates to indicate directly fundamental differences between the funds and to be fairly comparable. Rates representing divisions of the withdrawal rate, divisions of the mortality rate in active service, or divisions of the disability retirement rate are not so directly comparable. A low rate of dismissal, for example, may be accompanied by a high rate of resig-

nation, because the practice in the department may be to suggest a resignation in cases where a dismissal is likely to follow if the suggestion of resignation is not adopted. Similarly high rates of death and of disability from causes arising in the active service may be accompanied by very low rates of death and of disability from other causes. The fact that the rates from causes arising in the course of duty were high might, under some circumstances, indicate not so much the great dangers of the occupation as the laxity of the administrators in deciding what injuries, diseases and deaths were actually attributable to the risks of the service. Such rates must therefore be considered in connection with their complementary rates in making comparisons.

TABLE 197—COMPARATIVE RATES OF WITHDRAWAL FROM ACTIVE SERVICE
All Funds

AGE	HEALTH DEPARTMENT PENSION FUND MEN		CLERKS CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		LABORERS CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		College of the City of New York Retirement Fund		MECHANICS CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	Police Pension Fund	Supreme Court Retirement Funds Combined	Fire Department Relief Fund
	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate			1st Year	Ultimate	1st Year	Ultimate					
15	.0411	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	.0446	...	.0887	...	.1586	...	...	...	.0945	...	...	...	...	...	...	...	...
17	.0404	...	.1022	...	.1643	...	...	...	.1060	...	...	...	...	...	...	...	...
18	.0531	.0238	.1157	...	.1691	...	...	...	.1156	...	...	...	.0025	...	...	...	...
19	.0631	.0259	.1271	.0661	.1734	.0555	...	...	.1227	.0404	...	...	.0054	...	...	...	...
20	.0777	.0313	.1379	.0673	.1768	.0571	.1240	.1240	.1280	.0448	.1092	...	.0102	.0563	.0402	.0370	.0370
21	.1027	.0413	.1467	.0677	.1796	.0582	.1220	.1220	.1320	.0514	.1327	...	.0175	.0476	.0366	.0362	.0362
22	.1307	.0437	.1545	.0676	.1822	.0590	.1220	.1220	.1357	.0534	.1560	...	.0258	.0400	.0331	.0346	.0346
23	.1585	.0450	.1609	.0669	.1840	.0593	.1140	.1140	.1390	.0690	.1647	.0589	.0455	.0338	.0302	.0302	.0330
24	.1833	.0458	.1668	.0662	.1850	.0591	.1080	.1080	.1418	.0703	.1642	.0493	.0381	.0291	.0273	.0304	.0304
25	.2144	.0465	.1721	.0655	.1857	.0586	.1024	.1024	.1465	.0685	.1558	.0445	.0613	.0291	.0257	.0248	.0202
26	.2357	.0471	.1765	.0647	.1862	.0576	.0975	.0975	.1478	.0649	.1434	.0409	.0621	.0285	.0227	.0227	.0172
27	.2481	.0476	.1799	.0639	.1860	.0563	.0937	.0937	.1478	.0649	.1290	.0378	.0666	.0275	.0207	.0207	.0146
28	.2577	.0480	.1828	.0630	.1852	.0548	.0908	.0908	.1484	.0580	.1158	.0354	.0579	.0262	.0188	.0188	.0127
29	.2642	.0484	.1853	.0620	.1838	.0528	.0888	.0888	.1488	.0522	.1064	.0333	.0541	.0237	.0172	.0172	.0114
30	.2699	.0485	.1868	.0610	.1819	.0506	.0876	.0876	.1472	.0472	.1006	.0306	.0498	.0216	.0157	.0157	.0103
31	.2731	.0487	.1875	.0599	.1801	.0486	.0863	.0863	.1451	.0417	.0962	.0300	.0445	.0195	.0142	.0142	.0093
32	.2763	.0488	.1876	.0587	.1778	.0464	.0842	.0842	.1430	.0391	.0932	.0285	.0384	.0175	.0130	.0130	.0085
33	.2771	.0489	.1872	.0575	.1752	.0443	.0818	.0818	.1409	.0371	.0907	.0272	.0322	.0154	.0120	.0120	.0077
34	.2778	.0488	.1859	.0560	.1720	.0424	.0780	.0780	.1390	.0356	.0887	.0259	.0263	.0141	.0109	.0109	.0070
35	.2772	.0487	.1836	.0543	.1703	.0409	.0723	.0723	.1370	.0344	.0877	.0246	.0218	.0126	.0100	.0100	.0063
36	.2760	.0486	.1810	.0528	.1671	.0395	.0628	.0628	.1363	.0333	.0850	.0234	.0218	.0109	.0078	.0078	.0054
37	.2739	.0483	.1773	.0510	.1637	.0383	.0528	.0528	.1352	.0324	.0839	.0223	.0152	.0098	.0075	.0075	.0033
38	.2692	.0479	.1733	.0489	.1602	.0372	.0435	.0435	.1340	.0316	.0827	.0213	.0127	.0087	.0073	.0073	.0029
39	.2652	.0475	.1654	.0465	.1567	.0361	.0358	.0358	.1315	.0309	.0817	.0204	.0106	.0080	.0071	.0068	.0026
40	.2591	.0468	...	.0445	.1531	.0352	.0344	.0344	.1293	.0303	.0805	.0196	.0089	.0073	.0068	.0054	.0024
41	...	.0459	...	.0411	...	.0343	.0248	.0248	...	.0297	...	.0189	.0072	.0063	.0054	.0054	.0023

TABLE 197—COMPARATIVE RATES OF WITHDRAWAL FROM ACTIVE SERVICE—Continued
All Funds

AGE	HEALTH DEPARTMENT PENSION FUND MEN		CLERKS CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND MEN		LABORERS CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND MEN		College of the City of New York Retirement Fund		MECHANICS CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND MEN		DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	Police Pension Fund	Supreme Court Retirement Funds Combined	Fire Department Relief Fund
	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate					
420449	...	.0383	...	.0334	.0213	...	.0289	...	.0182	.0058	.0063	...	.0057	.0048	.0020
430437	...	.0354	...	.0324	.0184	...	.0282	...	.0176	.0044	.0058	...	.0050	.0043	.0019
440420	...	.0329	...	.0316	.0164	...	.0274	...	.0170	.0034	.0053	...	.0043	.0038	.0018
450399	...	.0306	...	.0307	.0147	...	.0264	...	.0166	.0027	.0050	...	.0036	.0034	.0017
460366	...	.0284	...	.0298	.0135	...	.0251	...	.0160	.0022	.0046	...	.0030	.0030	.0016
470317	...	.0264	...	.0289	.0122	...	.0232	...	.0156	.0018	.0041	...	.0025	.0027	.0015
480251	...	.0244	...	.0279	.0112	...	.0202	...	.0152	.0015	.0037	...	.0022	.0023	.0014
490212	...	.0226	...	.0270	.0106	...	.0175	...	.0148	.0014	.0033	...	.0019	.0021	.0013
500180	...	.0209	...	.0259	.0100	...	.0130	...	.0143	.0013	.0029	...	.0018	.0018	.0012
510156	...	.0191	...	.0248	.0094	...	.0078	...	.0140	.0012	.0026	...	.0017	.0016	.0010
520135	...	.0174	...	.0236	.0088	...	.0053	...	.0136	.0011	.0023	...	.0016	.0014	.0009
530116	...	.0157	...	.0223	.0085	...	.0037	...	.0132	.0010	.0020	...	.0016	.0012	.0007
540096	...	.0143	...	.0210	.0082	...	.0025	...	.0128	.0010	.0017	...	.0015	.0010	.0004
550079	...	.0129	...	.0197	.0077	...	.0018	...	.0123	.0009	.0014	...	.0014	.0009	.0003
560065	...	.0116	...	.0183	.0075	...	.0013	...	.0119	.0008	.0012	...	.0013	.0007	.0002
570051	...	.0104	...	.0170	.0071	...	.0009	...	.0114	.0007	.0010	...	.0011	.0006	.0001
580037	...	.0093	...	.0158	.0068	...	.0007	...	.0108	.0007	.0008	...	.0008	.0004	.0001
590023	...	.0081	...	.0145	.0065	...	.0005	...	.0103	.0006	.0005	...	.0006	.0003	.0001
600010	...	.0072	...	.0133	.0063	...	.0004	...	.0096	.0005	.0003	...	.0004	.0002	.0001
610009	...	.0059	...	.0119	.0057	...	.0003	...	.0090	.0004	.0001	...	.0003	.0001	.0001
620008	...	.0052	...	.0105	.0054	...	.0002	...	.0082	.0003	.0001	...	.0002	.0001	.0001
630008	...	.0043	...	.0089	.0050	...	.0001	...	.0074	.0002	.0001	...	.0001	.0001	.0001
640007	...	.0035	...	.0074	.0047	...	.0001	...	.0064	.0001	.0001	...	.0001	.0001	.0001
650006	...	.0027	...	.0061	.0044	...	...	...	.0055	.0001	.0001	...	.0001	.0001	.0001
660004	...	.0019	...	.0047	.0039	...	...	...	.0044	.0001	.0001	...	.0001	.0001	.0001
670002	...	.0012	...	.0036	.0036	...	...	...	.0034	.0001	.0001	...	.0001	.0001	.0001
680001	...	.0006	...	.0026	.0033	...	...	...	.0023	.0001	.0001	...	.0001	.0001	.0001
690002	...	.0017	.0027	...	...	...	.0011	.0001	.0001	...	.0001	.0001	.0001
700009	...	.0009	.0024	...	...	...	.0004	.0001	.0001	...	.0001	.0001	.0001
710004	...	.0004	.0019	...	...	...	.0001	.0001	.0001	...	.0001	.0001	.0001
720003	...	.0003	.0016	...	...	...	.0001	.0001	.0001	...	.0001	.0001	.0001
730001	...	.0001	.0013	...	...	...	.0001	.0001	.0001	...	.0001	.0001	.0001
740007	...	...	...	.0001	.0001	.0001	...	.0001	.0001	.0001
750003	...	...	...	.0001	.0001	.0001	...	.0001	.0001	.0001
760001	.0001	.0001	...	.0001	.0001	.0001

TABLE 198—COMPARATIVE RATES OF RESIGNATION FROM ACTIVE SERVICE

All Funds

AGE	HEALTH DEPARTMENT PENSION FUND		CLERKS — CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		MECHANICS — CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		LABORERS — CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		POLICE PENSION FUND	FIRE DEPARTMENT RELIEF FUND
	1st Year	Ulti-mate	1st Year	Ulti-mate	1st Year	Ulti-mate	1st Year	Ulti-mate	1st Year	Ulti-mate	Aggregate	Aggregate
15	.0232	...	...	...	...	...	...	...	...	...	...	...
16	.0272	...	.0749	...	.0790	...	.1040	...	...	...	...	...
17	.0328	...	.0880	...	.0913	...	.1100	...	...	...	...	...
18	.0395	.0066	.1010	...	.0999	...	.1150	...	...	...	...	...
19	.0488	.0100	.1120	.0597	.1068	.0286	.1194	.0379	...	...	...	...
20	.0650	.0170	.1220	.0607	.1120	.0333	.1230	.0396	.0470	...	.0450	.0306
21	.0915	.0284	.1300	.0610	.1158	.0402	.1260	.0408	.0461	...	.0360	.0289
22	.1210	.0320	.1370	.0608	.1190	.0520	.1289	.0416	.0455	...	.0281	.0273
23	.1500	.0344	.1425	.0600	.1219	.0584	.1309	.0420	.0448	.0232	.0217	.0257
24	.1810	.0362	.1473	.0591	.1240	.0599	.1321	.0419	.0439	.0203	.0168	.0232
25	.2080	.0377	.1515	.0583	.1257	.0600	.1330	.0415	.0430	.0181	.0134	.0130
26	.2300	.0390	.1548	.0574	.1267	.0585	.1339	.0406	.0422	.0161	.0111	.0101
27	.2430	.0401	.1571	.0565	.1270	.0551	.1339	.0394	.0414	.0142	.0096	.0076
28	.2530	.0411	.1590	.0555	.1262	.0492	.1333	.0380	.0405	.0127	.0083	.0058
29	.2600	.0420	.1605	.0544	.1248	.0427	.1323	.0361	.0398	.0115	.0069	.0045
30	.2660	.0426	.1610	.0532	.1213	.0363	.1308	.0341	.0391	.0105	.0057	.0036
31	.2695	.0432	.1609	.0520	.1171	.0324	.1292	.0322	.0383	.0097	.0046	.0028
32	.2730	.0437	.1602	.0507	.1125	.0299	.1274	.0302	.0375	.0090	.0036	.0022
33	.2740	.0442	.1590	.0494	.1074	.0280	.1251	.0283	.0370	.0085	.0028	.0017
34	.2750	.0444	.1570	.0478	.1021	.0266	.1230	.0266	.0364	.0081	.0022	.0014
35	.2745	.0446	.1541	.0460	.0963	.0255	.1208	.0253	.0358	.0076	.0019	.0011
36	.2735	.0447	.1511	.0444	.0913	.0245	.1180	.0241	.0352	.0073	.0016	.0009
37	.2715	.0447	.1472	.0425	.0862	.0237	.1150	.0231	.0346	.0069	.0014	.0007
38	.2670	.0445	.1430	.0404	.0812	.0229	.1120	.0223	.0341	.0066	.0013	.0006
39	.2630	.0443	.1350	.0380	.0762	.0223	.1090	.0214	.0338	.0063	.0012	.0004
40	.2570	.0438	.1322	.0360	.0722	.0217	.1060	.0208	.0331	.0061	.0011	.0003
41	...	.0431	...	.0327	...	.0212	...	.0201	...	.0058	.0009	.0002
42	...	.0423	...	.0300	...	.0205	...	.0195	...	.0055	.0008	.0001
43	...	.0412	...	.0272	...	.0198	...	.0189	...	.0053	.0006	.0001
44	...	.0397	...	.0249	...	.0192	...	.0184	...	.0050	.0005	...
45	...	.0377	...	.0228	...	.0183	...	.0179	...	.0048	.0004	...
46	...	.0345	...	.0209	...	.0172	...	.0174	...	.0045	.0003	...
47	...	.0297	...	.0193	...	.0157	...	.0169	...	.0043	.0003	...
48	...	.0233	...	.0177	...	.0131	...	.0164	...	.0040	.0003	...
49	...	.0195	...	.0163	...	.0111	...	.0160	...	.0038	.0003	...
50	...	.0164	...	.0150	...	.0077	...	.0155	...	.0035	.0003	...
51	...	.0141	...	.0136	...	.0046	...	.0150	...	.0033	.0001	...
52	...	.0120	...	.0124	...	.0032	...	.0144	...	.0030	.0001	...
53	...	.0102	...	.0112	...	.0023	...	.0138	...	.0028	.0001	...
54	...	.0083	...	.0102	...	.0016	...	.0132	...	.0026	.0001	...

TABLE 199—COMPARATIVE RATES OF DISMISSAL FROM ACTIVE SERVICE

All Funds

AGE	DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		LABORERS — CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		MECHANICS — CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		CLERKS — CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND		POLICE PENSION FUND	HEALTH DEPARTMENT PENSION FUND—MEN		FIRE DEPARTMENT RELIEF FUND
	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate	Aggregate	1st Year	Ultimate	Aggregate
15	...	...	...	...	...	...	...	...	...	.0179	...	...
16	...	...	.0546	...	.0155	...	.0138	...	...	.0174	...	...
17	...	...	.0543	...	.0156	...	.0142	...	...	.0166	...	...
18	...	...	.0541	...	.0157	...	.0147	...	...	.0156	.0172	...
19	...	...	.0540	.0176	.0159	.0118	.0151	.0064	...	.0143	.0159	...
20	.0622	...	.0538	.0175	.0160	.0115	.0159	.0066	.0113	.0127	.0143	.0074
21	.0866	...	.0536	.0174	.0162	.0112	.0167	.0067	.0116	.0112	.0129	.0073
22	.1105	...	.0533	.0174	.0167	.0109	.0175	.0068	.0119	.0097	.0117	.0073
23	.1199	.0357	.0531	.0173	.0171	.0106	.0184	.0069	.0121	.0085	.0106	.0073
24	.1203	.0290	.0529	.0172	.0178	.0104	.0195	.0071	.0123	.0073	.0096	.0072
25	.1128	.0264	.0527	.0171	.0185	.0102	.0206	.0072	.0123	.0064	.0088	.0073
26	.1012	.0248	.0523	.0170	.0198	.0100	.0217	.0073	.0123	.0057	.0081	.0071
27	.0876	.0236	.0521	.0169	.0208	.0098	.0228	.0074	.0122	.0051	.0075	.0070
28	.0753	.0227	.0519	.0168	.0222	.0097	.0238	.0075	.0120	.0047	.0069	.0069
29	.0666	.0218	.0515	.0167	.0240	.0095	.0248	.0076	.0117	.0042	.0064	.0069
30	.0615	.0211	.0511	.0165	.0259	.0094	.0258	.0078	.0111	.0039	.0059	.0067
31	.0579	.0203	.0509	.0164	.0280	.0093	.0266	.0079	.0101	.0036	.0055	.0065
32	.0557	.0195	.0504	.0162	.0305	.0092	.0274	.0080	.0090	.0033	.0051	.0063
33	.0537	.0187	.0501	.0160	.0335	.0091	.0282	.0081	.0079	.0031	.0047	.0060
34	.0523	.0178	.0499	.0158	.0369	.0090	.0289	.0082	.0071	.0028	.0044	.0056
35	.0519	.0170	.0495	.0156	.0407	.0089	.0295	.0083	.0064	.0027	.0041	.0052
36	.0498	.0161	.0491	.0154	.0450	.0088	.0299	.0084	.0062	.0025	.0039	.0045
37	.0493	.0154	.0487	.0152	.0490	.0087	.0301	.0085	.0061	.0024	.0036	.0046
38	.0486	.0147	.0482	.0149	.0528	.0087	.0303	.0085	.0060	.0022	.0034	.0043
39	.0479	.0141	.0477	.0147	.0553	.0086	.0304	.0085	.0059	.0022	.0032	.0042
40	.0474	.0135	.0471	.0144	.0571	.0086	.0303	.0085	.0057	.0021	.0030	.0041
41	...	.0131	...	.0142	...	.0085	...	.0084	.0054	...	.0028	.0040
42	...	.0127	...	.0139	...	.0084	...	.0083	.0049	...	.0026	.0040
43	...	.0123	...	.0135	...	.0084	...	.0082	.0044	...	.0025	.0040
44	...	.0120	...	.0132	...	.0083	...	.0080	.0038	...	.0023	.0041
45	...	.0118	...	.0128	...	.0081	...	.0078	.0032	...	.0022	.0041
46	...	.0115	...	.0124	...	.0079	...	.0075	.0027	...	.0021	.0041
47	...	.0113	...	.0120	...	.0075	...	.0071	.0022	...	.0020	.0041
48	...	.0112	...	.0115	...	.0071	...	.0067	.0020	...	.0018	.0041
49	...	.0110	...	.0110	...	.0064	...	.0063	.0017	...	.0017	.0041
50	...	.0108	...	.0104	...	.0053	...	.0059	.0016	...	.0016	.0041
51	...	.0107	...	.0098	...	.0032	...	.0055	.0016	...	.0015	.0041
52	...	.0106	...	.0092	...	.0021	...	.0050	.0015	...	.0015	.0041
53	...	.0104	...	.0085	...	.0014	...	.0045	.0015	...	.0014	.0041
54	...	.0102	...	.0078	...	.0009	...	.0041	.0014	...	.0013	.0041

TABLE 200—COMPARATIVE RATES OF DEATH IN ACTIVE SERVICE
All Funds

AGE	LABORERS CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND		CLERKS CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND		MECHANICS CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND		DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		Police Pension Fund		HEALTH DEPARTMENT PENSION FUND MEN		Fire Department Relief Fund		Supreme Court Retirement Funds Combined		Teachers' Retirement Fund Women		Teachers' Retirement Fund Men		College of the City of New York Retirement Fund	
	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	Aggregate	1st Year	Ulti- mate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	.0044	...	.0042	...	.0028	...	.0018	...	...	.0018	...	...	...	...	...	...	...	...	...	...	...
17	.0045	...	.0044	...	.0027	...	.0018	...	...	.0018	...	...	...	...	...	...	...	...	...	...	...
18	.0046	...	.0045	...	.0028	...	.0019	...	...	.0019	...	...	...	...	...	...	...	...	...	...	...
19	.0047	.0056	.0046	.0052	.0028	.0033	...	...	...	.0020	.0022	...	...	...	...	...	.0011	.0011	...	...	...
20	.0047	.0057	.0047	.0054	.0029	.0034	.0038	...	.0026	.0020	.0023	.0034	.0034	.0031	.0031	.0013	.0013	.0013	.0013	.0019	.0019
21	.0049	.0059	.0048	.0056	.0030	.0035	.0040	...	.0026	.0022	.0024	.0035	.0035	.0033	.0033	.0014	.0014	.0014	.0014	.0020	.0020
22	.0050	.0061	.0049	.0058	.0031	.0036	.0041	...	.0028	.0022	.0026	.0036	.0036	.0034	.0034	.0016	.0016	.0016	.0016	.0020	.0020
23	.0051	.0063	.0050	.0060	.0032	.0037	.0043	.0053	.0028	.0022	.0027	.0037	.0037	.0037	.0036	.0018	.0018	.0018	.0018	.0021	.0021	
24	.0053	.0065	.0052	.0063	.0033	.0038	.0046	.0058	.0029	.0022	.0029	.0038	.0038	.0038	.0037	.0020	.0020	.0020	.0020	.0021	.0021	
25	.0055	.0068	.0053	.0065	.0034	.0039	.0050	.0062	.0031	.0022	.0030	.0040	.0040	.0039	.0039	.0022	.0022	.0022	.0022	.0022	.0022	
26	.0058	.0071	.0055	.0068	.0034	.0041	.0055	.0067	.0032	.0022	.0032	.0041	.0041	.0040	.0040	.0024	.0024	.0024	.0024	.0024	.0024	
27	.0061	.0075	.0057	.0071	.0035	.0042	.0061	.0071	.0034	.0024	.0034	.0043	.0043	.0042	.0042	.0026	.0026	.0026	.0026	.0026	.0026	
28	.0064	.0079	.0059	.0074	.0037	.0045	.0066	.0076	.0038	.0025	.0037	.0044	.0044	.0044	.0044	.0030	.0030	.0030	.0030	.0030	.0030	
29	.0068	.0084	.0062	.0077	.0038	.0047	.0071	.0080	.0041	.0026	.0036	.0045	.0045	.0045	.0045	.0035	.0035	.0035	.0035	.0035	.0035	
30	.0073	.0091	.0064	.0080	.0041	.0050	.0075	.0084	.0044	.0027	.0041	.0046	.0046	.0046	.0046	.0043	.0043	.0043	.0043	.0043	.0043	
31	.0079	.0097	.0070	.0084	.0044	.0054	.0078	.0088	.0049	.0029	.0044	.0046	.0046	.0046	.0046	.0054	.0054	.0054	.0054	.0054	.0054	
32	.0085	.0105	.0076	.0087	.0047	.0058	.0082	.0091	.0053	.0031	.0047	.0047	.0047	.0047	.0047	.0061	.0061	.0061	.0061	.0061	.0061	
33	.0092	.0114	.0073	.0091	.0051	.0063	.0084	.0094	.0058	.0032	.0050	.0049	.0049	.0049	.0049	.0063	.0063	.0063	.0063	.0063	.0063	
34	.0098	.0122	.0076	.0095	.0055	.0067	.0086	.0096	.0063	.0034	.0053	.0049	.0049	.0049	.0049	.0066	.0066	.0066	.0066	.0066	.0066	
35	.0105	.0130	.0080	.0098	.0060	.0073	.0089	.0099	.0067	.0037	.0056	.0050	.0050	.0050	.0050	.0069	.0069	.0069	.0069	.0069	.0069	
36	.0112	.0138	.0083	.0102	.0066	.0079	.0091	.0101	.0072	.0038	.0059	.0051	.0051	.0051	.0051	.0071	.0071	.0071	.0071	.0071	.0071	
37	.0119	.0146	.0087	.0106	.0072	.0086	.0093	.0104	.0077	.0041	.0063	.0052	.0052	.0052	.0052	.0075	.0075	.0075	.0075	.0075	.0075	
38	.0127	.0155	.0092	.0112	.0078	.0094	.0096	.0106	.0081	.0045	.0067	.0054	.0054	.0054	.0054	.0077	.0077	.0077	.0077	.0077	.0077	
39	.0134	.0163	.0097	.0117	.0085	.0101	.0098	.0108	.0084	.0047	.0071	.0056	.0056	.0056	.0056	.0079	.0079	.0079	.0079	.0079	.0079	
40	.0142	.0171	.0103	.0123	.0091	.0108	.0100	.0111	.0086	.0051	.0080	.0067	.0067	.0067	.0067	.0083	.0083	.0083	.0083	.0083	.0083	
41	...	.0179	...	.0130	...	.0115	...	.0113	.0088	...	.0080	.0074	.0074	.0074	.0074	.0088	.0088	.0088	.0088	.0088	.0088
42	...	.0187	...	.0138	...	.0123	...	.0115	.0090	...	.0085	.0079	.0079	.0079	.0079	.0090	.0090	.0090	.0090	.0090	.0090
43	...	.0196	...	.0146	...	.0132	...	.0116	.0093	...	.0090	.0081	.0081	.0081	.0081	.0094	.0094	.0094	.0094	.0094	.0094
44	...	.0204	...	.0155	...	.0139	...	.0118	.0095	...	.0096	.0083	.0083	.0083	.0083	.0097	.0097	.0097	.0097	.0097	.0097
45	...	.0212	...	.0166	...	.0148	...	.0119	.0097	...	.0096	.0086	.0086	.0086	.0086	.0099	.0099	.0099	.0099	.0099	.0099
46	...	.0221	...	.0178	...	.0157	...	.0120	.0101	...	.0099	.0087	.0087	.0087	.0087	.0103	.0103	.0103	.0103	.0103	.0103
47	...	.0229	...	.0192	...	.0168	...	.0121	.0107	...	.0109	.0088	.0088	.0088	.0088	.0106	.0106	.0106	.0106	.0106	.0106
48	...	.0239	...	.0208	...	.0180	...	.0123	.0117	...	.0116	.0089	.0089	.0089	.0089	.0109	.0109	.0109	.0109	.0109	.0109
49	...	.0248	...	.0228	...	.0192	...	.0124	.0133	...	.0131	.0092	.0092	.0092	.0092	.0121	.0121	.0121	.0121	.0121	.0121
50	...	.0257	...	.0255	...	.0206	...	.0125	.0152	...	.0139	.0095	.0095	.0095	.0095	.0136	.0136	.0136	.0136	.0136	.0136
51	...	.0266	...	.0271	...	.0212	...	.0126	.0172	...	.0147	.0099	.0099	.0099	.0099	.0147	.0147	.0147	.0147	.0147	.0147
52	...	.0275	...	.0280	...	.0238	...	.0127	.0189	...	.0155	.0103	.0103	.0103	.0103	.0155	.0155	.0155	.0155	.0155	.0155

TABLE 200—COMPARATIVE RATES OF DEATH IN ACTIVE SERVICE—Continued
All Funds

AGE	LABORERS CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND		CLERKS CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND		MECHANICS CITY OF NEW YORK EMPLOYERS' RETIREMENT FUND		DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		Police Pension Fund	HEALTH DEPARTMENT PENSION FUND MEN		Fire Department Relief Fund	Supreme Court Retirement Funds Combined	Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	College of the City of New York Retirement Fund
	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate		1st Year	Ulti- mate					
530284	...	.0288	...	.0251	...	.0129	.0203	...	.0161	.0161	.0107	.0091	.0057	.0075
540293	...	.0292	...	.0266	...	.0130	.0213	...	.0173	.0166	.0112	.0097	.0062	.0081
550302	...	.0307	...	.0278	...	.0132	.0207	...	.0182	.0171	.0116	.0097	.0062	.0088
560309	...	.0311	...	.0287	...	.0134	.0224	...	.0192	.0176	.0122	.0112	.0080	.0097
570317	...	.0305	...	.0295	...	.0135	.0225	...	.0201	.0180	.0127	.0120	.0088	.0106
580325	...	.0308	...	.0302	...	.0137	.0235	...	.0208	.0184	.0133	.0129	.0096	.0119
590332	...	.0313	...	.0308	...	.0139	.0235	...	.0213	.0188	.0139	.0139	.0104	.0135
600340	...	.0318	...	.0315	...	.0142	.0247	...	.0218	.0192	.0146	.0150	.0113	.0155
610347	...	.0322	...	.0321	...	.0145	.0265	...	.0222	.0197	.0162	.0162	.0134	.0181
620354	...	.0327	...	.0327	...	.0148	.0290	...	.0225	.0201	.0162	.0175	.0155	.0212
630361	...	.0331	...	.0332	...	.0152	.0320	...	.0228	.0206	.0171	.0189	.0186	.0242
640368	...	.0335	...	.0341	...	.0156	.0355	...	.0232	.0214	.0181	.0204	.0208	.0272
650374	...	.0339	...	.0350	...	.0161	.0393	...	.0234	.0219	.0192	.0221	.0234	.0303
660382	...	.0344	...	.0361	...	.0167	.0432	...	.0238	.0229	.0205	.0240	.0257	.0336
670392	...	.0348	...	.0373	...	.0173	.0472	...	.0241	.0239	.0260	.0260	.0285	.0372
680401	...	.0353	...	.0389	...	.0180	.0512	...	.0245	.0254	.0239	.0282	.0318	.0412
690414	...	.0357	...	.0407	...	.0188	.0553	...	.0250	.0274	.0260	.0306	.0338	.0456
700428	...	.0361	...	.0420	...	.0195	.0596	...	.0256	.0295	.0285	.0332	.0360	.0502
710446	...	.0365	...	.0456	...	.0204	.0642	...	.0263	.0320	.0315	.0361	.0387	.0558
720467	...	.0371	...	.0488	...	.0222	.0692	...	.0272	.0351	.0350	.0392	.0424	.0620
730493	...	.0381	...	.0522	...	.0223	.0747	...	.0284	.0395	.0385	.0426	.0472	.0690
740529	...	.0398	...	.0561	...	.0239	.0807	...	.0298	...	.0426	.0463	.0537	.0762
750567	...	.0430	...	.0608	...	.0253	.0872	...	.0316	...	.0525	.0503	.0573	.0838
760610	...	.0468	...	.0655	...	.0270	.0943	...	.0339	...	.0535	.0556	.0726	.0913
770675	...	.0525	...	.0704	...	.0289	.1020	...	.0366	...	.0578	.0631	.0858	.0998
780748	...	.0592	...	.0756	...	.0316	...	...	.0400	...	.0635	.0737	.1020	.1188
790838	...	.0672	...	.0813	...	.0332	...	...	.0448	...	.0696	...	.1214	.1455
800950	...	.0770	...	.0875	...	.0356	...	...	.0507	...	.0763	...	.1445	.1888
811088	...	.0883	...	.0945	...	.0383	...	...	.0600	...	.0835	...	.1586	.1400
821230	...	.1000	...	.1020	...	.0406	...	...	.0750	...	.0915	...	...	...
831495	...	.1105	...	.1105	...	.0443	...	...	.1145	...	.1000	...	...	...
841620	...	.1200	...	.1200	...	.0475	...	...	.1200	...	.1005	...	...	...
851930	...	...	...	.1310	...	.0508	...	...	.1293	...	.1193	...	...	...
862330	...	...	...	.1475	...	.0545	...	...	.1399	...	.1293	...	...	...
872730	...	...	...	.1680	...	.0583	...	...	.1510	...	.1399	...	...	...
883110	...	...	...	...	...	.0625	...	...	.1623	...	.1510	...	...	...
893560	...	...	...	...	...	.0670	...	...	.1735	...	.1623	...	...	...
901735	...	...	...

TABLE 201—COMPARATIVE RATES OF DEATH IN ACTUAL PERFORMANCE OF DUTY, AND OTHER THAN IN ACTUAL PERFORMANCE OF DUTY

All Funds

AGE	RATE OF DEATH IN PERFORMANCE OF DUTY				RATE OF DEATH NOT IN PERFORMANCE OF DUTY			
	*Fire Department Relief Fund	Health Department Pension Fund Men		Police Pension Fund	Police Pension Fund	*Health Department Pension Fund Men		Fire Department Relief Fund
	Aggregate	1st Year	Ultimate	Aggregate	Aggregate	1st Year	Ultimate	Aggregate
15	...	...	...	...	...	.0018	...	...
16	...	...	...	...	...	.0018	...	...
17	...	...	...	...	...	.0018	...	...
18	...	...	...	...	...	.0019	.0021	...
19	...	...	...	...	...	.0020	.0022	...
20	.0001	.0000	...	...	.0026	.0020	.0023	.0033
21	.0002	.0001	...	...	.0026	.0021	.0024	.0033
22	.0003	.0001	...	.0001	.0027	.0021	.0026	.0033
23	.0004	.0001	.0001	.0001	.0027	.0021	.0026	.0033
24	.0005	.0001	.0001	.0002	.0027	.0021	.0028	.0033
25	.0006	.0001	.0001	.0003	.0028	.0021	.0029	.0034
26	.0007	.0001	.0002	.0003	.0029	.0021	.0030	.0034
27	.0009	.0002	.0002	.0003	.0031	.0022	.0032	.0034
28	.0010	.0002	.0003	.0004	.0034	.0023	.0034	.0034
29	.0011	.0002	.0003	.0004	.0037	.0024	.0036	.0034
30	.0012	.0003	.0004	.0004	.0040	.0024	.0037	.0034
31	.0012	.0004	.0006	.0004	.0045	.0025	.0038	.0034
32	.0012	.0006	.0009	.0004	.0049	.0025	.0038	.0035
33	.0013	.0007	.0011	.0004	.0054	.0025	.0039	.0036
34	.0013	.0008	.0012	.0004	.0059	.0026	.0041	.0036
35	.0013	.0009	.0013	.0004	.0063	.0028	.0043	.0037
36	.0013	.0009	.0014	.0004	.0068	.0029	.0045	.0038
37	.0014	.0009	.0014	.0004	.0073	.0032	.0049	.0038
38	.0014	.0010	.0015	.0004	.0077	.0035	.0052	.0040
39	.0014	.0010	.0015	.0004	.0080	.0037	.0056	.0041
40	.0014	.0010	.0015	.0004	.0082	.0041	.0060	.0042
41	.0014	...	.0015	.0004	.0084	...	.0065	.0043
42	.0014	...	.0015	.0004	.0086	...	.0070	.0045
43	.0013	...	.0015	.0005	.0088	...	.0075	.0048
44	.0013	...	.0015	.0005	.0090	...	.0081	.0050
45	.0012	...	.0014	.0005	.0092	...	.0089	.0054
46	.0012	...	.0014	.0006	.0095	...	.0095	.0061
47	.0012	...	.0013	.0008	.0099	...	.0103	.0072
48	.0011	...	.0012	.0008	.0109	...	.0111	.0091
49	.0010	...	.0011	.0008	.0125	...	.0120	.0111
50	.0009	...	.0009	.0008	.0144	...	.0130	.0127
51	.0007	...	.0006	.0008	.0164	...	.0141	.0140
52	.0006	...	.0005	.0006	.0183	...	.0150	.0149

*The Rate for the Department of Street Cleaning Pension Fund would Precede this Rate in Order if it were in Accordance with the Division which has been made for Valuation Purposes.

TABLE 201—COMPARATIVE RATES OF DEATH IN ACTUAL PERFORMANCE OF DUTY, AND OTHER THAN IN ACTUAL PERFORMANCE OF DUTY—Continued

All Funds

AGE	RATE OF DEATH IN PERFORMANCE OF DUTY				RATE OF DEATH NOT IN PERFORMANCE OF DUTY			
	*Fire Department Relief Fund	Health Department Pension Fund Men		Police Pension Fund	Police Pension Fund	*Health Department Pension Fund Men	Fire Department Relief Fund	
	Aggregate	1st Year	Ultimate	Aggregate	Aggregate	1st Year	Ultimate	Aggregate
53	.0004	...	.0004	.0004	.0199	...	.0160	.0157
54	.0002	...	.0004	.0002	.0211	...	.0169	.0164
55	.0001	...	.0003	.0002	.0218	...	.0179	.0170
560003	.0001	.0223	...	.0189	.0176
570003	...	.0225	...	.0198	.0180
580002	...	.0229	...	.0206	.0184
590002	...	.0235	...	.0211	.0188
600002	...	.0247	...	.0216	.0192
610002	...	.0265	...	.0220	.0197
620002	...	.0290	...	.0223	.0201
630001	...	.0320	...	.0227	.0206
640001	...	.0355	...	.0231	.0214
650001	...	.0393	...	.0233	.0219
660001	...	.0432	...	.0237	.0229
670001	...	.0472	...	.0240	.0239
680001	...	.0512	...	.0244	.0254
690001	...	.0553	...	.0249	.0274
700001	...	.0596	...	.0255	.0295
710001	...	.0642	...	.0262	.0320
720001	...	.0692	...	.0271	.0351
730747	...	.0284	.0395
740807	...	.0298	...
750872	...	.0316	...
760943	...	.0339	...
771020	...	.0366	...
780400	...
790448	...
800507	...
810600	...
820750	...
831145	...
841970	...
852650	...
86
87
88
89
90

*The Rate for the Department of Street Cleaning Pension Fund would Precede this Rate in Order, if it were in Accordance with the Division which has been made for Valuation Purposes.

TABLE 202—COMPARATIVE RATES OF SEPARATION FROM ACTIVE SERVICE BY DISABILITY

All Funds

AGE	POLICE PENSION FUND		DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		FIRE DEPARTMENT KELLEY FUND		LABORERS* City of New York Employees' Retirement Fund		MECHANICS* City of New York Employees' Retirement Fund		TEACHERS' RETIREMENT FUND WOMEN		SUPREME COURT, FIRST DEPARTMENT RETIREMENT FUND		CLERKS* City of New York Employees' Retirement Fund		HEALTH DEPARTMENT PENSION FUND MEN		TEACHERS' RETIREMENT FUND MEN	
	Aggregate	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate	Aggregate	Aggregate	1st Year	Ultimate	1st Year	Ultimate	1st Year	Ultimate	
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	.0006	.0001	...	...	.0011	.0010	.0009	.0010	.0011	.0011	.0013	...	...	...	.0002	.0003	.0002	.0002	...
21	.0007	.0001	...	...	.0013	.0012	.0010	.0011	.0011	.0011	.0013	...	...	...	.0003	.0003	.0002	.0002	...
22	.0009	.0001	...	...	.0015	.0013	.0010	.0012	.0012	.0012	.0014	...	...	...	.0003	.0004	.0002	.0002	...
23	.0010	.0001	.0001	...	.0016	.0014	.0011	.0014	.0013	.0013	.0015	...	...	...	.0004	.0004	.0003	.0003	...
24	.0011	.0001	.0001	...	.0018	.0015	.0012	.0015	.0014	.0014	.0016	...	...	...	.0004	.0005	.0003	.0003	...
25	.0012	.0001	.0001	...	.0020	.0016	.0013	.0016	.0014	.0014	.0016	...	...	...	.0005	.0005	.0003	.0003	...
26	.0014	.0001	.0001	...	.0022	.0017	.0014	.0017	.0014	.0014	.0017	...	...	...	.0005	.0006	.0004	.0004	...
27	.0016	.0001	.0002	...	.0025	.0019	.0015	.0019	.0015	.0015	.0018	...	...	...	.0005	.0006	.0004	.0004	...
28	.0019	.0002	.0002	...	.0026	.0020	.0016	.0020	.0015	.0015	.0018	...	...	...	.0005	.0007	.0004	.0006	...
29	.0022	.0003	.0003	...	.0028	.0022	.0018	.0022	.0015	.0015	.0019	...	...	...	.0006	.0007	.0005	.0007	...
30	.0025	.0005	.0006	...	.0030	.0024	.0019	.0024	.0016	.0016	.0020	...	...	...	.0006	.0008	.0005	.0007	...
31	.0029	.0010	.0011	...	.0032	.0026	.0021	.0026	.0017	.0017	.0021	...	...	...	.0007	.0008	.0005	.0008	...
32	.0034	.0016	.0018	...	.0035	.0028	.0022	.0028	.0017	.0017	.0021	...	...	...	.0007	.0009	.0006	.0009	...
33	.0039	.0021	.0023	...	.0039	.0030	.0024	.0030	.0018	.0018	.0022	...	...	...	.0008	.0010	.0006	.0009	...
34	.0046	.0026	.0029	...	.0044	.0033	.0027	.0033	.0019	.0019	.0023	...	...	...	.0008	.0010	.0006	.0010	...
35	.0055	.0031	.0035	...	.0053	.0039	.0029	.0039	.0020	.0020	.0024	...	...	...	.0009	.0011	.0007	.0010	...
36	.0065	.0036	.0040	...	.0064	.0040	.0032	.0040	.0021	.0021	.0025	...	...	...	.0010	.0012	.0007	.0011	...
37	.0076	.0043	.0048	...	.0082	.0044	.0036	.0044	.0022	.0022	.0027	...	.0004	...	.0011	.0013	.0007	.0011	...
38	.0094	.0048	.0053	...	.0105	.0048	.0040	.0048	.0023	.0023	.0028	...	.0016	...	.0012	.0015	.0008	.0012	...
39	.0118	.0056	.0062	...	.0119	.0053	.0044	.0053	.0025	.0025	.0029	...	.0029	...	.0013	.0016	.0008	.0012	...
40	.0153	.0064	.0070	...	.0130	.0058	.0048	.0058	.0026	.0026	.0031	...	.0045	...	.0015	.0018	.0008	.0012	...
41	.0197	...	.0075	...	.0135	.0064	...	.0064	...	.0032	.0032	...	.0064	...	.0020	.0020	...	.0012	...
42	.0259	...	.0082	...	.0139	.0071	...	.0071	...	.0034	.0034	...	.0088	...	...	...	...	.0012	...
43	.0327	...	.0091	...	.0140	.0078	...	.0078	...	.0036	.0036	...	.0099	...	.0021	.0021	...	.0013	...
44	.0400	...	.0100	...	.0139	.0086	...	.0086	...	.0039	.0039	...	.0099	...	.0024	.0024	...	.0013	...
45	.0473	...	.0106	...	.0138	.0094	...	.0094	...	.0041	.0041	...	.0099	...	...	...	...	.0013	...
46	.0542	...	.0115	...	.0138	.0104	...	.0104	...	.0044	.0044	...	.0113	...	.0029	.0029	...	.0014	...
47	.0595	...	.0125	...	.0139	.0114	...	.0114	...	.0047	.0047	...	.0114	...	.0033	.0033	...	.0014	...
48	.0640	...	.0135	...	.0141	.0124	...	.0124	...	.0050	.0050	...	.0116	...	.0036	.0036	...	.0015	...
49	.0669	...	.0145	...	.0148	.0135	...	.0135	...	.0053	.0053	...	.0116	...	.0040	.0040	...	.0015	...
50	.0686	...	.0156	...	.0152	.0149	...	.0149	...	.0057	.0057	...	.0116	...	.0045	.0045	...	.0016	...
51	.0689	...	.0169	...	.0157	.0165	...	.0165	...	.0062	.0062	...	.0116	...	.0050	.0050	...	.0017	...
52	.0680	...	.0182	...	.0163	.0184	...	.0184	...	.0067	.0067	...	.0116	...	.0056	.0056	...	.0017	...
53	.0658	...	.0202	...	.0168	.0207	...	.0207	...	.0073	.0073	...	.0116	...	.0064	.0064	...	.0017	...
54	.0628	...	.0232	...	.0168	.0232	...	.0232	...	.0074	.0074	...	.0116	...	.0069	.0069	...	.0017	...

NOTE.—This rate is that of disability without benefit; the disability with benefit is shown on table 1000.

N. B.—This table is that of disability without benefit; the disability with benefit is shown on table 203.

TABLE 202—COMPARATIVE RATES OF SEPARATION FROM ACTIVE SERVICE BY DISABILITY—Continued
All Funds.

AGE	POLICE PENSION FUND	DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND		FIRE DEPARTMENT RELIEF FUND	LABORERS*		MECHANICS*		TEACHERS' RETIREMENT FUND WOMEN	SUPREME COURT, FIRST DEPARTMENT RETIREMENT FUND	CLERKS*		HEALTH DEPARTMENT PENSION FUND MEN		TEACHERS' RETIREMENT FUND MEN
		1st Year	Ultimate		1st Year	Ultimate	1st Year	Ultimate			1st Year	Ultimate	1st Year	Ultimate	
55	.0582	...	.0250	.0174	...	.0254	...	.0089	.0072	.0087	...	.0078	...	.0034	.0028
56	.0527	...	.0281	.0170	...	.0269	...	.0100	.0071	.0086	...	.0081	...	.0041	.0033
57	.0470	...	.0325	.0185	...	.0283	...	.0111	.0071	.0085	...	.0083	...	.0048	.0038
58	.0414	...	.0388	.0193	...	.0292	...	.0121	.0071	.0083	...	.0084	...	.0054	.0043
59	.0354	...	.0500	.0201	...	.0297	...	.0120	.0071	.0080	...	.0084	...	.0061	.0049
60	.0306	...	.0670	.0212	...	.0299	...	.0136	.0071	.0077	...	.0084	...	.0068	.0056
61	.0264	...	.0810	.0222	...	.0298	...	.0140	.0070	.0072	...	.0083	...	.0074	.0064
62	.0227	...	.0935	.0235	...	.0293	...	.0143	.0070	.0067	...	.0081	...	.0077	.0073
63	.0190	...	.1045	.0250	...	.0284	...	.0143	.0069	.0060	...	.0078	...	.0080	.0082
64	.0159	...	.1140	.0270	...	.0272	...	.0140	.0068	.0051	...	.0074	...	.0082	.0080
65	.0128	...	.1220	.0296	...	.0255	...	.0136	.0065	.0040	...	.0069	...	.0083	.0076
66	.0100	...	.1278	.0326	...	.0227	...	.0128	.0061	.0029	...	.0061	...	.0083	.0070
67	.0069	...	.1332	.0364	...	.0189	...	.0119	.0054	.0022	...	.0052	...	.0082	.0062
68	.0045	...	.1385	.0412	...	.0147	...	.0107	.0044	.0017	...	.0043	...	.0077	.0044
69	.0026	...	.1440	.0474	...	.0109	...	.0092	.0030	.0013	...	.0035	...	.0069	.0022
70	...	...	.1488	.0547	...	.0085	...	.0075	.0001	.0010	...	.0028	...	.0060	.0006
71	...	...	.1540	...	...	.0067	...	.0061	...	.0007	...	.0023	...	.0050	...
72	...	...	.1590	...	...	.0054	...	.0051	...	.0005	...	.0018	...	.0043	...
73	...	...	.1638	...	...	.0044	...	.0042	...	.0004	...	.0015	...	.0036	...
74	...	...	.1685	...	...	.0037	...	.0036	...	.0002	...	.0012	...	.0031	...
75	...	...	.1720	...	...	.0030	...	.0030	...	.0001	...	.0010	...	.0026	...
76	...	...	.1760	...	...	.0025	...	.0025	...	...	...	.0008	...	.0021	...
77	...	...	.1798	...	...	.0020	...	.0020	...	...	...	.0006	...	.0017	...
78	...	...	.1826	...	...	.0016	...	.0017	...	...	...	.0004	...	.0014	...
79	...	...	.1859	...	...	.0012	...	.0013	...	...	...	.0003	...	.0010	...
80	...	...	.1887	...	...	.0008	...	.0011	...	...	...	.0002	...	.0007	...
81	...	...	.1918	...	...	.0005	...	.0008	...	...	...	.0001	...	.0003	...
82	...	...	.1945	...	...	.0001	...	.0006	...	...	...	...	...	...	...
83	...	...	.1972	...	...	...	...	.0004	...	...	...	...	...	...	...
84	...	...	.2000	...	...	...	...	.0002	...	...	...	...	...	...	...
85	...	...	.2030	...	...	...	...	...	...	...	...	...	...	...	...
86	...	...	.2050	...	...	...	...	...	...	...	...	...	...	...	...
87	...	...	.2075	...	...	...	...	...	...	...	...	...	...	...	...
88	...	...	.2100	...	...	...	...	...	...	...	...	...	...	...	...
89	...	...	.2135	...	...	...	...	...	...	...	...	...	...	...	...
90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

*N. B.—This rate is that of disability without pension; the disability with pension is shown on table 204.

TABLE 203—COMPARATIVE RATES OF SEPARATION FROM ACTIVE SERVICE BY DISABILITY OCCURRING IN PERFORMANCE OF DUTY AND RATES OF SEPARATION BY DISABILITY OCCURRING OTHER THAN IN PERFORMANCE OF DUTY

All Funds

Age	IN PERFORMANCE OF DUTY				NOT IN PERFORMANCE OF DUTY			
	Police Pension Fund	Health Department Pension Fund Men	Fire Department Relief Fund	Department of Street Cleaning Relief and Pension Fund	Police Pension Fund	Department of Street Cleaning Relief and Pension Fund	Fire Department Relief Fund	Health Department Pension Fund
	Aggregate	1st Year	Ultimate	1st Year	Ultimate	Aggregate	1st Year	Ultimate
15	...	.0001	...	...	...	...	...	...
16	...	.0002	...	...	...	...	...	...
17	...	.0002	...	...	...	...	...	...
18	...	.0002	.0002	...	...	...	...	...
19	...	.0002	.0002	...	...	...	...	...
20	.0006	.0002	.0003	.0001	...	.0011	...	...
21	.0007	.0003	.0003	.0001	...	.0013	...	...
22	.0009	.0003	.0003	.0001	...	.0015	...	...
23	.0010	.0003	.0004	.0001	.0001	.0016	...	...
24	.0011	.0003	.0004	.0001	.0001	.0018	...	...
25	.0012	.0003	.0005	.0001	.0001	.0019	...	...
26	.0014	.0004	.0005	.0001	.0001	.0021	...	...
27	.0016	.0004	.0006	.0001	.0002	.0023	...	...
28	.0019	.0004	.0006	.0002	.0002	.0024	...	...
29	.0022	.0005	.0007	.0002	.0002	.0026	...	...
30	.0023	.0005	.0007	.0002	.0002	.0028	...	...
31	.0023	.0005	.0008	.0002	.0003	.0030	...	...
32	.0023	.0006	.0009	.0003	.0003	.0032	...	...
33	.0023	.0006	.0009	.0004	.0004	.0035	...	...
34	.0023	.0006	.0010	.0004	.0004	.0037	...	...
35	.0023	.0007	.0010	.0004	.0005	.0040	...	...
36	.0022	.0007	.0011	.0005	.0005	.0043	...	...
37	.0021	.0007	.0011	.0005	.0006	.0044	...	...
38	.0018	.0008	.0012	.0005	.0006	.0047	...	...
39	.0011	.0008	.0012	.0005	.0006	.0051	...	...
40	.0008	.0008	.0012	.0006	.0006	.0058	...	...
41	.0007	...	.0012	.0006	.0006	.0064	...	...
42	.0005	...	.0013	.0006	.0006	.0069	...	...
43	.0004	...	.0013	.0006	.0006	.0076	...	...
44	.0004	...	.0013	.0006	.0006	.0085	...	...
45	.0003	...	.0013	.0006	.0006	.0094	...	...
46	.0003	...	.0014	.0005	.0005	.0100	...	...
47	.0002	...	.0015	.0005	.0005	.0110	...	...
48	.0002	...	.0015	.0005	.0005	.0120	...	...
49	.0002	...	.0015	.0005	.0005	.0130	...	...
50	.0002	...	.0016	.0004	.0004	.0141	...	.0001
51	.0001	...	.0016	.0002	.0002	.0152	...	.0001
52	.0001	...	.0016	.0002	.0002	.0166	...	.0003
					.0079	.0179	.0156	.0005

All Funds

[illegible]

TABLE 204—COMPARATIVE RATES OF SERVICE RETIREMENT
All Funds

Age	Fire Department Relief Fund	Police Pension Fund	Women — Teachers' Retirement Fund	Men — Health Department Pension Fund	*Supreme Court — Second Department Retirement Fund	Supreme Court — First Department Retirement Fund	Men — Teachers' Retirement Fund	*Mechanics — City of New York Employees' Retirement Fund	*Clerks — City of New York Employees' Retirement Fund	College of The City of New York Retirement Fund	*Laborers — City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund
36	...	...	...	.0007	...	...	...	...	...	...	...	...
37	...	...	...	.0017	...	...	...	...	...	...	...	...
38	...	...	...	.0030	...	...	...	...	...	...	...	...
39	...	...	...	.0041	...	...	...	...	...	...	...	...
40	...	...	...	.0060	.0005	...	...	...	...	.0010	...	...
41	...	...	...	.0077	.0018	...	...	...	...	.0013	...	...
42	.0058	...	...	.0099	.0036	...	...	...	...	.0017	...	...
43	.0129	...	...	.0120	.0049	...	...	...	...	.0021	...	...
44	.0464	...	...	.0140	.0061	...	...	...	...	.0024	...	...
45	.0504	...	...	.0162	.0079	.0003	...	.0025	...	.0028	...	...
46	.0640	...	.0003	.0187	.0097	.0016	...	.0032	.0006	.0033	.0003	...
47	.0690	...	.0053	.0211	.0113	.0038	.0004	.0038	.0017	.0038	.0009	...
48	.0720	...	.0112	.0237	.0129	.0050	.0014	.0046	.0029	.0043	.0017	...
49	.0743	...	.0183	.0260	.0148	.0066	.0026	.0053	.0039	.0049	.0022	...
50	.0768	...	.0282	.0284	.0164	.0080	.0041	.0061	.0051	.0055	.0029	...
51	.0788	...	.0370	.0311	.0184	.0098	.0084	.0068	.0064	.0062	.0036	...
52	.0808	...	.0455	.0338	.0200	.0113	.0084	.0077	.0077	.0069	.0045	...
53	.0828	...	.0520	.0305	.0220	.0132	.0108	.0087	.0090	.0076	.0033	...
54	.0850	...	.0578	.0391	.0239	.0151	.0132	.0097	.0103	.0083	.0062	...
55	.0872	.0008	.0637	.0419	.0259	.0172	.0159	.0107	.0118	.0092	.0073	...
56	.0898	.1205	.0697	.0450	.0284	.0198	.0185	.0118	.0132	.0101	.0086	...
57	.0930	.1310	.0752	.0480	.0305	.0220	.0212	.0132	.0149	.0111	.0098	...
58	.0965	.1330	.0819	.0510	.0330	.0247	.0241	.0148	.0168	.0122	.0111	...
59	.1008	.1400	.0883	.0541	.0351	.0274	.0274	.0163	.0184	.0134	.0127	...
60	.1060	.1500	.0950	.0575	.0378	.0301	.0313	.0182	.0207	.0147	.0145	.0093
61	.1123	.1610	.1028	.0612	.0405	.0333	.0360	.0203	.0230	.0161	.0165	.0183
62	.1210	.1711	.1109	.0650	.0435	.0368	.0413	.0227	.0255	.0176	.0187	.0259
63	.1318	.1758	.1200	.0690	.0460	.0400	.0478	.0252	.0283	.0191	.0211	.0327
64	.1450	.1753	.1318	.0735	.0490	.0439	.0559	.0283	.0314	.0209	.0240	.0395
65	.1613	.1687	.1502	.0782	.0517	.0477	.0656	.0317	.0348	.0227	.0269	.0459

*N. B.—These rates are those for retirement on pension after 30 years service in case of disability.
*N. B.—These rates are those for retirement on pension after 25 years service in case of disability.

TABLE 204—COMPARATIVE RATES OF SERVICE RETIREMENT—Continued

All Funds

Age	Fire Department Relief Fund	Police Pension Fund	Women Teachers' Retirement Fund	Men Health Department Pension Fund	**Supreme Court Second Department Retirement Fund	Supreme Court First Department Retirement Fund	Men Teachers' Retirement Fund	*Mechanics City of New York Employees' Retirement Fund	*Clerks City of New York Employees' Retirement Fund	College of The City of New York Retirement Fund	*Laborers City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund
66	.1820	.1568	.1745	.0840	.0548	.0519	.0766	.0358	.0386	.0247	.0304	.0535
67	.2000	.1415	.2040	.0900	.0583	.0501	.0916	.0403	.0428	.0268	.0343	.0589
68	.2400	.1316	.2430	.0971	.0626	.0609	.1108	.0458	.0478	.0297	.0386	.0657
69	.2930	.1309	.2890	.1057	.0672	.0659	.1326	.0523	.0535	.0328	.0436	.0727
70	.3500	.1508	.3370	.1157	.0720	.0710	.1680	.0598	.0604	.0303	.0490	.0797
71	.4500	.1966	.3880	.1285	.0777	.0770	.2075	.0608	.0606	.0408	.0555	.0878
72	.7500	.2727	.4400	.1440	.0835	.0830	.2505	.0820	.0825	.0458	.0625	.0960
73	.9605	.3732	.5040	.1640	.0899	.0895	.2980	.0967	.0820	.0521	.0710	.1050
74	...	.4952	.5660	.1900	.0967	.0965	.3470	.1142	.1400	.0607	.0810	.1142
75	...	.6226	.6280	.2260	.1041	.1040	.3980	.1460	.1850	.0724	.0925	.1242
76	...	.7445	.7000	.2720	.1125	.1125	.4510	.1950	.2380	.0936	.1005	.1350
77	...	.8502	.7820	.3230	.1215	.1215	.5060	.2300	.3025	.1350	.1225	.1470
78	...	.8897	.8790	.3730	.1310	.1310	.5630	.2860	.3775	.2400	.1400	.1597
79	...	...	.9860	.4210	.1420	.1420	.6240	.3500	.4575	.4900	.1590	.1728
80	...	...	...	.4740	.1543	.1543	.6890	.4100	.5450	.7440	.1780	.1870
81	...	...	...	.5330	.1675	.1675	.7610	.4680	.6400	.8000	.1985	.2030
82	...	...	...	.5910	.1830	.1830	...	.5270	.7300	...	.2215	.2200
83	...	...	...	.6460	.2010	.2010	...	.5800	.8350	...	.2550	.2380
84	...	...	...	.7000	.2225	.2225	...	.6350	.9500	...	.2900	.2590
85	...	...	...	.7450	.2490	.2490	...	.6970	...	...	.3380	.2810
86	...	...	...	...	.2850	.2850	...	.7620	...	...	.4000	.3060
87	...	...	...	...	.3375	.3375	...	.8270	...	...	.4725	.3310
88	...	...	...	...	.4250	.4250	...	.8950	...	...	.5650	.3610
89	...	...	...	...	.5900	.5900	...	.9650	...	...	.6750	.3920
90	...	...	...	...	.8265	.8265	...	...	...	...	.8000	...

*N. B.—These rates are those for retirement on pension after 30 years service in case of disability.

**N. B.—These rates are those for retirement on pension after 25 years service in case of disability.

Table 205 on page 387 gives, for comparative purposes, the rates of salary increase for the various departments, that is the ratios between the salary of each age and the salary at the age next above it. Since these ratios are based on average salaries for considerable groups they are not necessarily applicable to individuals within the group, because the increase as shown by the salary rate may result in one extreme case from a comparatively small increase common to practically all the individuals of the group or it may result in the other extreme case from comparatively large increases confined to a few individuals of the group. The rates are, however, indicative of the trend of the salary of the average employee. The rates are not shown beyond age 44, as in some departments the average salaries began to decline after that age. It should be noted that these rates are presented merely for the purpose of permitting a comparison of the trend of the salaries in the different departments and branches of the service; and they are broadly comparable. They were not used in the actual valuation. For that work salary scales were used graduated from the actual average salaries of the employees, classified by age, according to the method described on page 31.

TABLE 205—RATES OF SALARY INCREASE

All Funds

Age	College of the City of New York Retirement Fund	Teachers' Retirement Fund Men	Clerks City of New York Employees' Retirement Fund	Health Department Pension Fund Men	Teachers' Retirement Fund Women	Mechanics City of New York Employees' Retirement Fund	Police Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	Labors City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund
20	.156	.066	.207	.143	.018	.109	.044	.002	.049	.077	.011
21	.159	.084	.169	.136	.025	.095	.044	.012	.047	.063	.013
22	.116	.091	.125	.110	.032	.079	.048	.034	.050	.047	.010
23	.115	.100	.109	.088	.040	.072	.051	.057	.045	.038	.009
24	.121	.090	.078	.075	.051	.063	.051	.073	.044	.032	.009
25	.088	.091	.057	.062	.061	.056	.054	.053	.041	.022	.009
26	.072	.080	.043	.051	.059	.047	.052	.057	.036	.021	.006
27	.065	.068	.031	.042	.068	.040	.049	.033	.036	.016	.007
28	.057	.068	.030	.038	.062	.035	.046	.031	.030	.017	.006
29	.050	.062	.025	.031	.058	.030	.042	.026	.029	.010	.005
30	.052	.057	.023	.026	.052	.025	.038	.023	.027	.009	.004
31	.043	.051	.019	.022	.049	.022	.033	.020	.024	.006	.001
32	.043	.047	.017	.019	.049	.019	.028	.019	.021	.004	.005
33	.040	.043	.018	.017	.044	.013	.025	.025	.018	.002	.001
34	.037	.038	.016	.015	.042	.010	.020	.021	.018	.001	.001
35	.037	.035	.015	.016	.034	.008	.017	.027	.013	.001	.001
36	.032	.027	.013	.010	.031	.007	.012	.029	.011	.000	.001
37	.030	.024	.015	.009	.028	.006	.012	.029	.009	.000	.001
38	.029	.023	.011	.009	.025	.004	.011	.019	.004	.001	.001
39	.028	.025	.012	.007	.020	.002	.010	.033	.004	.001	.001
40	.027	.022	.010	.006	.019	.001	.009	.022	.002	.004	.001
41	.022	.018	.010	.006	.014	.001	.007	.019	.002	.001	.001
42	.024	.025	.007	.006	.016	.001	.006	.019	.002	.001	.001
43	.019	.021	.007	.002	.012	.001	.006	.015	.000	.001	.001
44	.021	.026	.005	.000	.013	.001	.004	.016	.000	.002	.000

TABLE 206—COMPARATIVE RATES OF MOR

All

Age	Department of Street Cleaning Relief and Pension Fund	Supreme Court First Department Retirement Fund	Fire Department Relief Fund	Health Department Pension Fund	Teachers' Retirement Fund Men	Police Pension Fund	Teachers' Retirement Fund Women
20	.2080	...	.4578	.1200	...	.2210	...
21	.2070	...	.4485	.1157	...	.2140	...
22	.2050	...	.4338	.1110	...	.2060	...
23	.2030	...	.4150	.1067	...	.1980	...
24	.2010	...	.3995	.1023	...	.1885	...
25	.1992	...	.3475	.0982	...	.1790	...
26	.1975	...	.2750	.0944	...	.1687	...
27	.1960	...	.2200	.0906	...	.1573	...
28	.1940	...	.1850	.0869	...	.1452	...
29	.1920	...	.1600	.0833	...	.1341	...
30	.1900	...	.1417	.0800	...	.1239	...
31	.1880	...	.1278	.0765	...	.1140	...
32	.1862	...	.1175	.0734	...	.1050	...
33	.1845	...	.1090	.0704	...	.0967	...
34	.1822	...	.1015	.0673	...	.0890	...
35	.1805	...	.0952	.0644	...	.0818	...
36	.1780	...	.0900	.0615	...	.0753	...
37	.1758	...	.0858	.0587	...	.0695	...
38	.1735	...	.0820	.0560	.0280	.0642	...
39	.1710	...	.0788	.0533	.0297	.0592	.0241
40	.1688	.0850	.0758	.0509	.0313	.0547	.0244
41	.1663	.0850	.0734	.0487	.0327	.0506	.0247
42	.1640	.0850	.0712	.0465	.0339	.0472	.0250
43	.1617	.0860	.0692	.0444	.0354	.0441	.0253
44	.1595	.0860	.0677	.0425	.0367	.0418	.0257
45	.1570	.0870	.0662	.0408	.0382	.0398	.0260
46	.1545	.0880	.0650	.0393	.0388	.0382	.0264
47	.1520	.0880	.0640	.0381	.0394	.0370	.0268
48	.1493	.0890	.0632	.0371	.0400	.0362	.0272
49	.1468	.0900	.0628	.0363	.0405	.0357	.0278
50	.1440	.0910	.0622	.0356	.0409	.0353	.0283
51	.1415	.0920	.0620	.0352	.0412	.0352	.0290
52	.1385	.0940	.0618	.0350	.0416	.0353	.0296
53	.1358	.0960	.0618	.0353	.0418	.0358	.0302
54	.1330	.0990	.0619	.0358	.0421	.0362	.0311
55	.1302	.1010	.0622	.0365	.0423	.0369	.0320
56	.1280	.1030	.0627	.0376	.0425	.0379	.0329
57	.1255	.1050	.0634	.0389	.0426	.0390	.0340
58	.1236	.1070	.0640	.0405	.0429	.0402	.0350
59	.1220	.1090	.0650	.0424	.0432	.0419	.0363
60	.1205	.1110	.0660	.0449	.0436	.0435	.0377
61	.1192	.1130	.0671	.0474	.0453	.0453	.0392
							.0409

TALITY AMONG DISABILITY PENSIONERS

Funds

Age	Department of Street Cleaning Relief and Pension Fund	Supreme Court First Department Retirement Fund	Fire Department Relief Fund	Health Department Pension Fund	Teachers' Retirement Fund Men	Police Pension Fund	Teachers' Retirement Fund Women
62	.1185	.1140	.0685	.0503	.0469	.0471	.0427
63	.1180	.1140	.0700	.0535	.0509	.0492	.0448
64	.1185	.1150	.0713	.0570	.0553	.0514	.0467
65	.1194	.1150	.0730	.0608	.0602	.0538	.0488
66	.1208	.1150	.0750	.0659	.0634	.0562	.0513
67	.1230	.1150	.0772	.0692	.0667	.0589	.0539
68	.1262	.1150	.0795	.0739	.0700	.0618	.0569
69	.1302	.1150	.0820	.0789	.0738	.0646	.0600
70	.1360	.1150	.0850	.0843	.0775	.0675	.0633
71	.1430	.1160	.0882	.0909	.0812	.0710	.0671
72	.1520	.1160	.0920	.0977	.0848	.0742	.0714
73	.1610	.1160	.0960	.1050	.0882	.0780	.0759
74	.1725	.1170	.1000	.1135	.0914	.0819	.0810
75	.1825	.1180	.1050	.1220	.0944	.0860	.0866
76	.1940	.1190	.1105	.1316	.1023	.0908	.0930
77	.2050	.1210	.1163	.1420	.1111	.0955	.1000
78	.2180	.1260	.1230	.1533	.1208	.1014	.1080
79	.2325	.1330	.1300	.1655	.1317	.1079	.1165
80	.2500	.1445	.1382	.1800	.1445	.1153	.1260
81	.2675	.1586	.1480	.1965	.1586	.1245	.1370
82	.2875	.1743	.1580	.2140	.1743	.1354	.1483
83	.3085	.1916	.1690	.2340	.1916	.1495	.1605
84	.3302	.2114	.1815	.2560	.2114	.1655	.1725
85	.3560	.2356	.1960	.2820	.2356	.1850	.1851
86	.3802	.2657	.2120	.3100	.2657	.2100	.1990
87	.4100	.3030	.2310	.3450	.3030	.2380	.2140
88	.4400	.3467	.2530	.3860	.3467	.2740	.2290
89	.4700	.3959	.2770	.4280	.3959	.3135	.2450
90	.5050	.4545	.3075	.4700	.4546	.3575	.2630
91	.5450	.5325	.3475	.5150	.5325	.4100	.2825
92	.5900	.6343	.3925	.5600	.6343	.4650	.3030
93	.6350	.7342	.4450	.6100	.7342	.5300	.3240
94	.6850	.8571	.5025	.6640	.8571	.6050	.3465
95	.7350	1.0000	.5800	.7260	1.0000	.6850	.3710
96	.7900	...	.6750	.7980	...	.7700	.3970
97	.8500	...	.7700	.8880	...	.8630	.4250
98	.9150	...	.9750	.9850	...	.9600	.4550
99	.9800	...	1.0000	1.0000	...	...	.4880
100	1.0000	...	...	...	...	...	.5240
101	...	...	...	...	...	...	.5590
102	...	...	...	...	...	...	.6000

TABLE 207—COMPARATIVE RATES OF MORTALITY AMONG SERVICE PENSIONERS

All Funds

Age	Department of Street Cleaning Relief and Pension Fund	Police Pension Fund	Fire Department Relief Fund	Teachers' Retirement Fund Men	Laborers City of New York Employees' Retirement Fund	Mechanics City of New York Employees' Retirement Fund	Clerks City of New York Employees' Supreme Court Retirement Fund College of the City of New York Retirement Fund	Health Department Pension Fund	Teachers' Retirement Fund Women
35	...	...	...	...	...	...	...	.0049	...
36	...	...	...	...	...	...	...	.0051	...
37	...	...	...	...	...	...	...	.0053	...
38	...	...	...	...	...	...	...	.0055	...
39	...	...	...	...	...	...	...	.0058	...
40	...	...	...	...	...	...	.0106	.0062	...
41	...	...	.0087	...	...	...	.0109	.0064	...
42	...	...	.0096	...	...	...	.0112	.0067	...
43	...	...	.0104	...	...	...	.0116	.0071	...
44	...	...	.0112	...	...	...	.0120	.0074	...
45	...	...	.0123	...	.0112	.0113	.0125	.0077	...
46	...	...	.0136	.0385	.0116	.0118	.0130	.0083	.0132
47	...	...	.0149	.0387	.0120	.0124	.0135	.0087	.0137
48	...	...	.0163	.0389	.0125	.0132	.0141	.0093	.0143
49	...	...	.0180	.0391	.0131	.0138	.0147	.0098	.0148
50	...	...	.0200	.0393	.0138	.0145	.0154	.0104	.0153
51	...	...	.0223	.0395	.0145	.0153	.0162	.0110	.0159
52	...	...	.0248	.0397	.0154	.0162	.0170	.0118	.0164
53	...	...	.0273	.0399	.0163	.0172	.0180	.0126	.0169
54	...	...	.0302	.0402	.0174	.0180	.0190	.0134	.0175
55	...	.0429	.0335	.0407	.0186	.0194	.0201	.0144	.0181
56	...	.0436	.0370	.0411	.0199	.0206	.0213	.0154	.0187
57	...	.0444	.0402	.0418	.0213	.0220	.0227	.0166	.0194
58	...	.0452	.0427	.0426	.0229	.0237	.0241	.0178	.0201
59	...	.0461	.0464	.0436	.0247	.0253	.0258	.0192	.0209
60	.0605	.0470	.0488	.0448	.0267	.0272	.0275	.0207	.0218
61	.0636	.0480	.0510	.0460	.0289	.0293	.0294	.0223	.0229
62	.0668	.0492	.0530	.0476	.0313	.0314	.0315	.0240	.0240
63	.0700	.0508	.0545	.0494	.0339	.0338	.0338	.0258	.0255
64	.0739	.0525	.0560	.0516	.0369	.0366	.0364	.0279	.0271
65	.0776	.0544	.0575	.0538	.0401	.0397	.0391	.0299	.0290
66	.0818	.0563	.0590	.0566	.0437	.0428	.0421	.0323	.0312
67	.0860	.0582	.0610	.0593	.0476	.0462	.0454	.0348	.0337
68	.0909	.0626	.0630	.0626	.0520	.0498	.0490	.0377	.0366
69	.0960	.0664	.0653	.0660	.0568	.0540	.0529	.0408	.0399

TABLE 207—COMPARATIVE RATES OF MORTALITY AMONG SERVICE PENSIONERS—Continued

All Funds

Age	Department of Street Cleaning Relief and Pension Fund	Police Pension Fund	Fire Department Relief Fund	Teachers' Retirement Fund Men	Laborers City of New York Employees' Retirement Fund	Mechanics City of New York Employees' Retirement Fund	Clerks City of New York Employees' Retirement Fund Supreme Court Retirement Fund College of the City of New York Retirement Fund	Health Department Pension Fund	Teachers' Retirement Fund Women
70	.1019	.0712	.0678	.0698	.0620	.0583	.0572	.0439	.0436
71	.1080	.0777	.0710	.0738	.0677	.0638	.0619	.0479	.0477
72	.1150	.0850	.0742	.0778	.0737	.0690	.0670	.0519	.0523
73	.1220	.0936	.0780	.0823	.0802	.0756	.0726	.0565	.0573
74	.1300	.1025	.0834	.0875	.0870	.0823	.0786	.0619	.0629
75	.1390	.1108	.0877	.0933	.0944	.0893	.0852	.0678	.0680
76	.1500	.1188	.0940	.0999	.1023	.0976	.0924	.0748	.0755
77	.1605	.1260	.1020	.1070	.1111	.1060	.1002	.0827	.0826
78	.1725	.1340	.1120	.1152	.1208	.1146	.1087	.0914	.0902
79	.1865	.1425	.1250	.1248	.1317	.1238	.1179	.1014	.0988
80	.2030	.1520	.1400	.1358	.1445	.1338	.1279	.1125	.1079
81	.2180	.1624	.1740	.1497	.1586	.1456	.1387	.1250	.1177
82	.2360	.1745	.2070	.1647	.1743	.1585	.1505	.1387	.1284
83	.2530	.1900	.2430	.1820	.1916	.1723	.1631	.1547	.1397
84	.2720	.2100	.2800	.2020	.2114	.1883	.1768	.1710	.1521
85	.2910	.2400	.3220	.2250	.2356	.2060	.1915	.1890	.1652
86	.3140	.2925	.3500	.2525	.2657	.2250	.2074	.2100	.1795
87	.3380	.3700	.3940	.2840	.3030	.2440	.2244	.2330	.1947
88	.3660	.4050	.4300	.3180	.3407	.2640	.2426	.2500	.2110
89	.3950	.4580	.4650	.3580	.3959	.2890	.2621	.2830	.2284
90	.4270	.5760	.5020	.4040	.4545	.3160	.2830	.3130	.2469
91	.4620	.6230	.5410	.4560	.5325	.3440	.3051	.3500	.2666
92	.5000	.6650	.5830	.5110	.6343	.3730	.3286	.3940	.2876
93	.5400	.7070	.6250	.5750	.7442	.4040	.3535	.4460	.3098
94	.5900	.7500	.6700	.6500	.8171	.4300	.3797	.5150	.3332
95	.6400	.7930	.7160	.7340	1.0000	.4770	.4072	.6140	.3579
96	.7200	.8350	.7680	.8180	...	.5200	.4359	.7440	.3838
97	.7750	.8800	.8200	.9020	...	.5070	.4659	.9050	.4108
98	.8450	.9240	.8750	.9850	...	.6220	.4960	1.0000	.4390
99	.9200	.9710	.9350	...	...	.6780	.5288	...	.4682
100	1.0000	1.0000	1.0000	...	...	.7400	.5615	...	.4984
101	...	...	...	...	...	...	.5947	...	.5203
102	...	...	...	...	...	...	.6283	...	.5609
103	...	...	...	...	...	...	.6619	...	.5930
104	...	...	...	...	...	...	.5000	...	...

DEVELOPMENT OF ADJUSTED TOTAL SEPARATION RATES BY USE OF STANDARD SERVICE

The rates given in the preceding tables are in the form required for valuation purposes, but because of their number (a rate is required for each single age) and because of the differences between departments as regards the age distribution of employees, it is very difficult to obtain a general idea of the comparative mortality or service experience of employees in the various departments. Crude rates of separation are sometimes cited to show such differences, but they are often misleading. Crude pension fund separation rates are, if anything, more affected by differences in the age distribution of the body of persons to which they relate than are crude population death rates. In population vital statistics the advisability is recognized of using standardized death rates, which eliminate differences arising solely from differences in age distribution and make the rates show only differences in mortality. An attempt has been made, for this report, to develop index figures for each department which are comparable with similar figures for every other department and which supply a single statistical measure of service conditions.

In actuarial work the mortality of different classes is frequently compared by means of the ratio of actual cases of death to the number to be expected according to a certain standard mortality rate. Such a method is not affected by the differences in age distribution in the exposed to risk, since the standard rate and the actual rate are both applied to the same exposure by ages. While the ratios obtained by this method are reliable comparative figures, the application of the method requires the use of a standard rate. No standard rates were available for comparison with the various rates of separation derived from the pension funds, and although a set of rates to be used as a standard could have been developed from a combination of all the experience available, this procedure was not adopted. Instead, a standard exposure column was prepared. Such column is used in the same way that the standard population is used in population vital statistics for computing standardized death rates. The various rates of separation from the service were applied to the standard exposure column by age and the expected separations were thus derived. These expected separations were then summed and the total divided by the corresponding total of the exposed to risk for these ages. The resulting ratio is what may be called a standardized total rate of separation for the cause and service to which the rate is applicable.

The age distribution adopted for the standard exposure column is, broadly speaking, that obtaining among all employees on the active service rolls of the various departments of the city service combined; and the distribution by length of service, that obtaining among all employees on the active rolls of those departments or branches of the service for which it seemed necessary to develop select rates combined. The exact distribution adopted is immaterial, so long as the standard selected may be regarded as reasonably like an average service. The figures on which the present stand-

ard is based have therefore been smoothed by graduation and increased so that the total exposure for all ages combined is one hundred thousand.

As the select rates are not shown above age 40 for the first year of service the standardized rates are somewhat affected by the use of the ultimate column only beyond that age; however, these differences may be safely disregarded in this case.

In the following tables the details of the sheets on which the standardized rates were prepared have been summed by five year groups and are shown for the central age of each group. The ultimate and aggregate rates, however, were multiplied into the exposure age by age; the aggregate rates into the aggregate exposure column, and for the departments where the select rates were used the ultimate rates into the ultimate column. In applying the select rates to the respective exposure columns, however, it was considered sufficient to combine the exposure in five year age groups and to apply the central rate. The sum of the results for the four select exposure columns were combined and the resulting total for each five year group was then treated as if it had been obtained by the use of an aggregate rate. In presenting the results the exposure employed is first shown and then the tables of expected cases. Attention is called to the fact that the expected service retirements are only for ages below 65 and consequently do not include the total experience.

**TABLE 208—SUMMARY OF STANDARD EXPOSURE COLUMNS
EMPLOYED IN THE CALCULATION OF STANDARD RATES
OF SEPARATION**

All Funds

Central Year of Age Group	First Year of Service	Second Year of Service	Third Year of Service	Ultimate Years of Service	Aggregate Years of Service
22	2,453	2,203	1,728	2,350	8,734
27	3,061	3,082	2,765	7,694	16,602
32	1,982	2,138	1,960	11,693	17,773
37	1,352	1,404	1,504	12,285	16,545
42	198	380	733	12,354	13,665
47	...	...	...	10,599	10,599
52	...	...	...	7,854	7,854
57	...	...	...	5,197	5,197
62	...	...	...	3,031	3,031
Total.....	9,046	9,207	8,690	73,057	100,000

TABLE 209—STANDARD EXPECTED SEPARATIONS FROM SERVICE ON ACCOUNT OF WITHDRAWAL OBTAINED
BY USE OF THE GRADUATED RATES AND THE STANDARD EXPOSURE

All Funds

TOTAL WITHDRAWALS

Central Year of Age	Health Department Pension Fund Men	Clerks City of New York Employees' Retirement Fund	Laborers City of New York Employees' Retirement Fund	College of New York Retirement Fund	Mechanics City of New York Employees' Retirement Fund	Department of Street Cleaning Pension Fund	Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	Police Pension Fund	Supreme Court Retirement Fund	Fire Department Relief Fund
22	730.5	947.7	899.8	1,002.9	849.3	861.7	344.4	229.9	322.5	274.1	289.9
27	1,750.3	1,471.4	1,403.3	1,567.1	1,508.6	1,136.3	980.9	446.9	362.6	343.7	249.5
32	1,618.1	1,666.4	1,197.8	1,485.8	1,104.5	723.5	680.0	313.2	227.9	233.8	151.7
37	1,321.8	1,102.5	880.8	891.9	783.1	511.5	261.9	166.4	126.1	138.3	68.4
42	723.7	576.4	499.4	305.6	442.6	275.6	82.9	86.8	77.8	67.3	28.2
47	333.0	283.0	306.9	133.0	240.7	165.9	20.6	44.4	28.5	28.8	15.7
52	109.4	138.9	187.7	71.1	54.7	106.9	8.8	18.4	13.1	11.4	6.9
57	27.9	55.6	90.1	37.2	5.7	59.4	4.1	5.2	5.6	3.2	1.0
62	2.5	16.2	32.5	16.7	5.5	24.9	9.9	3.3	1.4	1.1	...
Totals	6,617.2	6,238.1	5,558.3	5,511.3	4,989.7	3,865.7	2,384.5	1,311.5	1,164.5	1,100.7	811.3

RESIGNATIONS

Central Year of Age	Health Department Pension Fund Men	Clerks City of New York Employees' Retirement Fund	Laborers City of New York Employees' Retirement Fund	College of New York Retirement Fund	Mechanics City of New York Employees' Retirement Fund	Department of Street Cleaning Pension Fund	Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	Police Pension Fund	Supreme Court Retirement Fund	Fire Department Relief Fund
22	638.1	820.2	647.6	...	724.4	303.3	...	...	219.1	...	226.1
27	1,638.2	1,249.3	1,056.7	...	1,273.8	382.7	...	...	163.3	...	133.1
32	1,533.2	1,449.7	826.6	...	859.2	261.3	...	...	67.3	...	41.6
37	1,264.1	908.8	573.6	...	547.3	178.8	...	...	24.5	...	12.2
42	687.8	449.7	301.5	...	304.7	89.5	...	...	11.2	...	2.4
47	312.1	207.7	180.1	...	161.6	45.4	...	...	3.0	...	1
52	97.9	99.2	115.0	...	32.1	24.0	...	...	1.0	...	...
57	22.2	40.0	58.8	...	3.6	10.0	...	...	1	...	...
62	1	11.9	22.3	...	1.4	2.2	...	...	...	...	...
Totals	6,103.7	5,245.5	3,782.2	...	3,907.1	1,297.2	...	...	489.5	...	415.5

DISMISSALS

Central Year of Age	Health Department Pension Fund Men	Clerks City of New York Employees' Retirement Fund	Laborers City of New York Employees' Retirement Fund	College of New York Retirement Fund	Mechanics City of New York Employees' Retirement Fund	Department of Street Cleaning Pension Fund	Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	Police Pension Fund	Supreme Court Retirement Fund	Fire Department Relief Fund
22	92.4	118.5	252.2	...	124.9	558.4	...	...	103.4	...	63.8
27	12.1	222.1	406.6	...	234.8	753.6	...	...	199.3	...	116.4
32	84.9	216.7	371.2	...	245.3	462.2	...	...	160.6	...	110.1
37	57.7	193.7	307.2	...	235.8	332.7	...	...	101.6	...	56.2
42	35.9	120.7	197.9	...	137.9	186.1	...	...	66.6	...	25.8
47	20.9	75.3	126.8	...	79.1	120.5	...	...	25.5	...	15.6
52	11.5	39.7	72.7	...	22.6	82.9	...	...	12.1	...	6.9
57	5.7	15.6	31.3	...	2.1	40.4	...	...	5.5	...	1.0
62	2.4	4.3	10.2	...	1.1	22.7	...	...	...	...	...
Totals	423.5	1,012.6	1,776.1	...	1,082.6	2,568.5	...	...	675.11	...	305.4

TABLE 210—STANDARD EXPECTED SEPARATIONS FROM SERVICE ON ACCOUNT OF DEATH OBTAINED BY USE OF THE GRADUATED RATES AND THE STANDARD EXPOSURE

All Funds											
TOTAL DEATHS FROM ALL CAUSES											
Central Year	Central Age Group	Supreme Court Retirement Fund	Teachers' Retirement Fund Men	Teachers' Retirement Fund Women	Fire Department Relief Fund	Health Department Pension Fund	Police Department Pension Fund	Department of Street Cleaning Relief and Pension Fund	Mechanics City of New York Employees' Retirement Fund	Clerks City of New York Employees' Retirement Fund	Labors City of New York Employees' Retirement Fund
22	22	30.7	15.3	15.0	32.3	20.8	24.5	40.8	29.6	47.8	49.9
27	27	69.7	45.9	45.9	70.3	52.3	58.3	113.9	67.5	112.0	110.4
32	32	89.6	100.2	61.7	84.4	79.6	94.7	158.9	100.0	150.1	182.2
37	37	99.3	85.3	64.4	86.7	99.0	126.0	169.0	139.9	173.2	236.4
42	42	97.8	40.5	65.5	80.2	115.3	123.2	155.9	167.3	187.8	254.3
47	47	90.2	33.2	65.9	93.0	122.6	117.0	128.5	177.3	204.0	242.5
52	52	80.5	41.4	66.5	119.4	121.2	144.1	99.7	184.2	216.6	214.8
57	57	65.7	44.6	61.8	93.1	102.8	117.4	70.3	152.1	158.1	163.8
62	62	48.7	40.4	52.5	60.9	67.9	87.8	44.6	98.7	98.6	100.9
Total.		672.2	452.8	499.2	720.3	781.5	893.0	981.6	1,116.6	1,348.2	1,570.2

DEATHS IN PERFORMANCE OF DUTY											
22	22	...	...	...	3.0	.6	1.0	4.9	...	...	...
27	27	...	...	...	14.5	3.4	5.5	14.3	...	...	...
32	32	...	...	...	22.0	14.4	7.0	19.9	...	...	...
37	37	...	...	...	22.6	22.2	6.7	21.2	...	...	...
42	42	...	...	...	18.2	20.3	6.0	19.8	...	...	...
47	47	...	...	...	12.1	13.7	7.6	16.1	...	...	...
52	52	...	...	...	4.6	4.8	4.5	12.6	...	...	...
57	57	...	...	...	.1	1.4	.3	9.0	...	...	...
62	62	...	...	...	...	.6	...	5.6	...	...	...
Total.		...	...	...	97.1	81.4	38.6	123.4	...	...	...

DEATHS FROM OTHER CAUSES											
22	22	...	...	...	29.3	20.2	23.5	35.9	...	...	...
27	27	...	...	...	55.8	49.0	52.9	99.6	...	...	...
32	32	...	...	...	62.4	65.1	87.7	139.0	...	...	...
37	37	...	...	...	64.1	76.9	119.2	147.8	...	...	...
42	42	...	...	...	62.0	95.0	117.2	136.1	...	...	...
47	47	...	...	...	80.9	108.8	109.4	112.4	...	...	...
52	52	...	...	...	114.8	116.4	139.6	87.1	...	...	...
57	57	...	...	...	93.0	101.4	117.1	61.3	...	...	...
62	62	...	...	...	60.9	67.3	87.8	39.0	...	...	...
Total.		...	...	...	623.2	700.1	854.4	858.2	...	...	...

TABLE 212—STANDARD EXPECTED SEPARATIONS FROM SERVICE ON ACCOUNT OF SERVICE RETIREMENT
OBTAINED BY USE OF THE GRADUATED RATES AND THE STANDARD EXPOSURE

All Funds

Central Year of Age Group	Fire Department Relief Fund	Police Pension Fund	Teachers' Retirement Fund Women	Health Department Pension Fund	*Supreme Court Second Department Retirement Fund	Supreme Court First Department Retirement Fund	Teachers' Retirement Fund Men	*Mechanics City of New York Employees' Retirement Fund	*Clerks City of New York Employees' Retirement Fund	College of the City of New York Retirement Fund	*Laborers City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund
22	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	22.9	...	...	...	...	...	...	...	...
42	244.2	...	...	123.0	44.3	7	...	...	...	22.7	...	...
47	706.7	...	69.0	221.2	117.7	39.4	8.6	40.4	18.2	39.9	10.2	...
52	632.6	...	338.5	262.5	156.2	88.4	64.5	60.2	59.2	53.3	34.4	...
57	482.3	775.4	387.4	246.3	156.5	112.6	108.3	67.9	76.3	57.2	49.9	...
62	367.2	500.8	333.9	195.1	129.6	109.4	144.8	68.0	76.5	52.6	56.0	71.3
Total	2,433.0	1,276.2	1,128.8	1,071.0	604.3	350.5	306.2	236.5	230.2	225.7	150.5	71.3

*Although these cases are technically disability retirements, they were used as service retirements.

The total rates shown in the preceding tables, 209 to 212, are brought together in the following table, which gives the rates by cause of separation and expresses them in terms of the number of separations per thousand employees per year.

TABLE 213—STANDARD TOTAL RATES OF SEPARATION EXPRESSED AS NUMBER OF SEPARATIONS PER THOUSAND EMPLOYEES FOR EACH FUND

All Funds

DEPARTMENT OR CLASS	Total	WITHDRAWALS			DEATHS			DISABILITY			Service Retirements
		Resignations	Dismissals	Total	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total	
Health Department Pension Fund.....	86.091	61.937	4.235	66.172	.814	7.001	7.815	.940	.454	1.394	10.710
City of New York Employees Retirement Fund:											
Clerks.....	80.708	52.455	10.126	62.581	...	...	13.482	...	...	2.343	2.302**
Laborers.....	80.324	37.822	17.761	55.583	...	...	15.702	...	...	7.534	1.505**
Mechanics.....	67.103	39.071	10.826	49.897	...	...	11.166	...	...	3.675	2.365**
College of the City of New York Retirement Fund.....	61.793	...	...	55.113	...	...	4.423	...	...	...	2.257
Department of Street Cleaning Relief and Pension Fund.....	58.671	12.972	25.685	38.657	1.234	8.582	9.816	.348	9.137	9.485	.713
Police Pension Fund.....	53.822	4.895	6.750	11.645	.386	8.544	8.930	1.198	19.287	20.485	12.762
Fire Department Relief Fund.....	48.467	4.155	3.958	8.113	.971	6.232	7.203	.459	8.362	8.821	24.330
Teachers' Retirement Fund:											
Women.....	43.769	...	...	23.845	...	...	4.992	...	...	3.644	11.288
Supreme Court, First Department, Retirement Fund.....	23.772	...	...	11.007	...	...	6.722	...	...	2.538	3.505
Supreme Court, Second Department, Retirement Fund.....	23.772	...	...	11.007	...	...	6.722	...	...	...	6.043*
Teachers' Retirement Fund: Men.....	21.364	...	...	13.115	...	...	4.528	...	...	.659	3.062

*N.B.—These rates are those for retirement on pension after 25 years of service in case of disability.

**N.B.—These rates are those for retirement on pension after 30 years of service in case of disability.

ANNUITY VALUES APPLICABLE TO PENSIONERS

The annuity values applicable to the various classes of pensioners have all been given in the separate sections dealing with individual funds. They are brought together in the following table so that comparisons may be made easily.

TABLE 214—COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLES FOR DISABILITY PENSIONERS

All Funds

Age	Teachers' Retirement Fund Women	Police Pension Fund	Teachers' Retirement Fund Men	Health Department Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	Department of Street Cleaning Relief and Pension Fund
20	...	4.258	...	7.393	1.732	...	3.796
21	...	4.518	...	7.646	1.875	...	3.828
22	...	4.816	...	7.905	2.093	...	3.864
23	...	5.153	...	8.162	2.426	...	3.901
24	...	5.534	...	8.421	2.924	...	3.938
25	...	5.951	...	8.676	3.699	...	3.975
26	...	6.406	...	8.929	4.602	...	4.013
27	...	6.888	...	9.180	5.384	...	4.053
28	...	7.384	...	9.427	6.013	...	4.096
29	...	7.875	...	9.667	6.534	...	4.140
30	...	8.358	...	9.900	6.971	...	4.185
31	...	8.828	...	10.127	7.341	...	4.231
32	...	9.276	...	10.341	7.657	...	4.278
33	...	9.698	...	10.545	7.934	...	4.329
34	...	10.089	...	10.738	8.175	...	4.382
35	...	10.447	...	10.916	8.387	...	4.437
36	...	10.767	...	11.078	8.564	...	4.497
37	...	11.047	...	11.223	8.717	...	4.557
38	13.751	11.288	12.392	11.347	8.848	...	4.619
39	13.621	11.489	12.224	11.450	8.957	...	4.683
40	13.488	11.648	12.066	11.529	9.047	7.492	4.747
41	13.349	11.765	11.918	11.585	9.118	7.450	4.814
42	13.206	11.840	11.776	11.619	9.172	7.399	4.882
43	13.057	11.878	11.639	11.628	9.212	7.342	4.951
44	12.904	11.879	11.510	11.611	9.234	7.287	5.022
45	12.744	11.850	11.386	11.568	9.242	7.223	5.096
46	12.579	11.794	11.272	11.500	9.237	7.156	5.170
47	12.408	11.712	11.155	11.408	9.217	7.090	5.244
48	12.231	11.608	11.036	11.294	9.186	7.013	5.318
49	12.049	11.487	10.913	11.158	9.132	6.934	5.390
50	11.861	11.349	10.787	11.002	9.090	6.852	5.461
51	11.668	11.196	10.654	10.825	8.994	6.770	5.527
52	11.469	11.030	10.515	10.630	8.950	6.684	5.590
53	11.263	10.852	10.367	10.417	8.868	6.592	5.645
54	11.053	10.665	10.209	10.191	8.774	6.516	5.692
55	10.838	10.469	10.041	9.953	8.673	6.442	5.728
56	10.618	10.265	9.861	9.704	8.563	6.366	5.750
57	10.393	10.056	9.667	9.446	8.447	6.303	5.762
58	10.161	9.841	9.458	9.180	8.325	6.253	5.758
59	9.926	9.622	9.234	8.909	8.192	6.189	5.739
60	9.688	9.402	8.994	8.632	8.057	6.153	5.706
61	9.445	9.179	8.736	8.355	7.915	6.121	5.656
62	9.200	8.954	8.471	8.076	7.769	6.083	5.588
63	8.951	8.727	8.199	7.796	7.614	6.066	5.503
64	8.701	8.499	7.936	7.517	7.455	6.027	5.399
65	8.447	8.269	7.686	7.239	7.336	5.992	5.283

**TABLE 214—COMPARATIVE ANNUITY VALUES BASED ON
MORTALITY TABLES FOR DISABILITY PENSIONERS—
Continued**

All Funds

Age	Teachers' Retirement Fund Women	Police Pension Fund	Teachers' Retirement Fund Men	Health Department Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	Department of Street Cleaning Relief and Pension Fund
66	8.189	8.040	7.452	6.962	7.117	5.941	5.146
67	7.929	7.808	7.220	6.695	6.917	5.869	4.996
68	7.667	7.576	6.988	6.421	6.757	5.810	4.831
69	7.403	7.344	6.757	6.150	6.577	5.772	4.655
70	7.137	7.109	6.526	5.879	6.371	5.673	4.468
71	6.869	6.871	6.293	5.609	6.174	5.551	4.276
72	6.600	6.633	6.057	5.345	5.977	5.402	4.083
73	6.332	6.389	5.815	5.084	5.771	5.314	3.894
74	6.064	6.143	5.562	4.826	5.558	5.169	3.707
75	5.796	5.892	5.294	4.576	5.357	4.985	3.531
76	5.530	5.635	5.005	4.327	5.133	4.841	3.353
77	5.268	5.374	4.720	4.084	4.921	4.644	3.184
78	5.009	5.104	4.437	3.844	4.679	4.459	3.010
79	4.757	4.828	4.157	3.608	4.471	4.144	2.838
80	4.511	4.546	3.880	3.373	4.234	3.856	2.669
81	4.273	4.256	3.609	3.143	4.027	3.613	2.507
82	4.047	3.962	3.343	2.922	3.827	3.446	2.350
83	3.831	3.665	3.080	2.704	3.581	3.087	2.200
84	3.627	3.370	2.818	2.493	3.382	2.716	2.056
85	3.430	3.076	2.558	2.285	3.138	2.328	1.916
86	3.239	2.788	2.299	2.086	2.923	1.976	1.785
87	3.057	2.512	2.048	1.891	2.664	1.962	1.655
88	2.883	2.245	1.810	1.708	2.466	1.400	1.541
89	2.715	2.000	1.588	1.545	2.232	1.000	1.436
90	2.549	1.773	1.369	1.400	2.031	...	1.330
91	2.393	1.560	1.157	1.260	1.787	...	1.218
92	2.245	1.369	.959	1.131	1.574	...	1.105
93	2.104	1.188	.804	1.009	1.371	...	.938
94	1.965	1.023	.652	.826	1.000	...	.900
95	1.832	.874	...	.667	.750	...	...
96	1.701	.747	...	...	...	...	...
97	1.582	.600	...	...	...	...	...
98	1.465	...	...	...	...	...	...
99	1.333	...	...	...	...	...	...
100	1.167	...	...	...	...	...	...

TABLE 215—COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLE FOR SERVICE PENSIONERS

All Funds

Age	Teachers' Retirement Fund Women	Health Department Pension Fund	Clerks City of New York Employees' Retirement Fund Supreme Court Retirement Fund College of the City of New York Retirement Fund	Mechanics City of New York Employees' Retirement Fund	Laborers City of New York Employees' Retirement Fund	Teachers' Retirement Fund Men	Fire Department Relief Fund	Police Pension Fund	Department of Street Cleaning Relief and Pension Fund
35	...	18.108	...	...	...	...	...	...	...
36	...	17.902	...	...	...	...	...	...	...
37	...	17.691	...	...	...	...	...	...	...
38	...	17.474	...	...	...	...	...	...	...
39	...	17.251	...	...	...	...	...	...	...
40	...	17.022	15.801	...	...	...	...	...	...
41	...	16.791	15.583	...	...	...	14.549	...	...
42	...	16.551	15.358	...	...	...	14.240	...	...
43	...	16.306	15.128	...	...	...	13.927	...	...
44	...	16.056	14.891	...	...	...	13.611	...	...
45	...	15.799	14.649	14.731	14.748	...	13.291	...	...
46	14.976	15.534	14.400	14.451	14.485	11.457	12.971	...	...
47	14.757	15.266	14.146	14.201	14.214	11.352	12.646	...	...
48	14.534	14.992	13.885	13.928	13.936	11.240	12.323	...	...
49	14.306	14.713	13.619	13.651	13.651	11.122	11.999	...	...
50	14.074	14.427	13.348	13.369	13.358	10.996	11.677	...	...
51	13.837	14.137	13.071	13.081	13.060	10.862	11.362	...	...
52	13.594	13.840	12.789	12.787	12.755	10.730	11.054	...	...
53	13.345	13.539	12.502	12.489	12.444	10.598	10.756	...	...
54	13.089	13.234	12.211	12.187	12.128	10.466	10.464	...	...
55	12.826	12.923	11.915	11.877	11.867	10.334	10.187	9.987	...
56	12.556	12.609	11.615	11.566	11.482	10.253	9.923	9.808	...
57	12.277	12.290	11.312	11.251	11.153	9.861	9.676	9.622	...
58	11.990	11.969	11.005	10.933	10.821	9.660	9.441	9.428	...
59	11.695	11.644	10.696	10.613	10.485	9.450	9.226	9.224	...
60	11.392	11.316	10.384	10.291	10.148	9.233	9.016	9.012	...
61	11.080	10.987	10.070	9.967	9.869	9.008	8.812	8.789	7.685
62	10.761	10.655	9.754	9.643	9.470	8.774	8.609	8.555	7.454
63	10.434	10.321	9.438	9.317	9.130	8.536	8.404	8.311	7.223
64	10.101	9.984	9.121	8.991	8.790	8.291	8.193	8.058	6.993
65	9.763	9.647	8.804	8.666	8.452	8.044	7.976	7.796	6.761
66	9.422	9.306	8.488	8.343	8.116	7.792	7.749	7.524	6.299
67	9.077	8.964	8.173	8.022	7.782	7.539	7.512	7.241	6.069
68	8.732	8.620	7.859	7.701	7.452	7.282	7.267	6.951	5.837
69	8.386	8.275	7.548	7.382	7.127	7.024	7.011	6.658	5.605

TABLE 215—COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLE FOR SERVICE
PENSIONERS—Continued
All Funds

Age	Teachers' Retirement Fund Women	Health Department Pension Fund	Clerks — Employees' Retirement Fund Supreme Court Retirement Fund College of the City of New York Retirement Fund	Mechanics — City of New York Employees' Retirement Fund	Labors — City of New York Employees' Retirement Fund	Teachers' Retirement Fund Men	Fire Department Relief Fund	Police Pension Fund	Department of Street Cleaning Relief and Pension Fund
70	8.043	7.930	7.339	7.066	6.807	6.764	6.744	6.359	5.373
71	7.702	7.582	6.934	6.751	6.493	6.504	6.467	6.001	5.143
72	7.365	7.236	6.633	6.444	6.185	6.241	6.179	5.771	4.913
73	7.034	6.889	6.336	6.145	5.883	5.975	5.881	5.491	4.686
74	6.708	6.542	6.045	5.851	5.586	5.704	5.569	5.226	4.459
75	6.389	6.199	5.758	5.564	5.294	5.432	5.246	4.977	4.232
76	6.078	5.858	5.478	5.282	5.005	5.137	4.912	4.736	4.005
77	5.775	5.523	5.205	5.012	4.719	4.880	4.563	4.499	3.791
78	5.480	5.195	4.938	4.748	4.436	4.601	4.205	4.359	3.578
79	5.194	4.873	4.678	4.490	4.156	4.321	3.838	4.014	3.368
80	4.917	4.562	4.426	4.236	3.880	4.040	3.468	3.762	3.166
81	4.650	4.260	4.182	3.986	3.608	3.761	3.114	3.591	2.979
82	4.391	3.968	3.946	3.743	3.342	3.488	2.791	3.326	2.797
83	4.143	3.688	3.718	3.508	3.080	3.220	2.504	2.934	2.627
84	3.904	3.423	3.499	3.279	2.818	2.959	2.254	2.625	2.462
85	3.675	3.166	3.289	3.061	2.557	2.705	2.031	2.398	2.302
86	3.455	2.919	3.088	2.855	2.299	2.459	1.851	1.960	2.143
87	3.246	2.685	2.896	2.660	2.048	2.225	1.698	1.646	1.992
88	3.046	2.463	2.712	2.471	1.810	2.006	1.558	1.393	1.843
89	2.856	2.244	2.538	2.286	1.585	1.766	1.439	1.235	1.703
90	2.675	2.029	2.372	2.112	1.367	1.598	1.298	1.120	1.569
91	2.504	1.815	2.215	1.951	1.154	1.414	1.167	1.020	1.440
92	2.341	1.605	2.067	1.800	.955	1.246	1.026	.933	1.316
93	2.188	1.396	1.927	1.656	.791	1.095	.750	.853	1.198
94	2.043	1.184	1.796	1.515	.632	.958	...	.764	1.076
95	1.907	.967	1.673	1.384	...	.841	...	.667	.960
96	1.778	.763	1.558	1.257	...	.667	...	...	.859
97	1.656	.569	1.448	1.161	...	...	...	...	.775
98	1.548	...	1.349	1.100	...	...	...	...	.722
99	1.433	...	1.253	.921	...	...	...	...	...
100	1.343	...	1.168	.833	...	...	...	...	...
101	1.218	...	1.071	...	...	...	...	...	...
102	1.055	...	.986	...	...	...	...	...	...
103	.885	...	.917	...	...	...	...	...	...

BASIS FOR DERIVING WEIGHTED AVERAGES FOR THE ENTIRE SERVICE, TO BE USED IN COMPARISON WITH FIGURES FOR INDIVIDUAL FUNDS

Comparisons of different funds in respect to the cost of the benefits allowed under them is of much importance in considering the argument that there should be a greater degree of equality among the employees of the different services in the matter of the amount paid by the city to provide pensions for them. Such comparisons are facilitated by working out pension costs, expressed as percentages of salary, for what may be termed the average entrant into the city service as a unit; in other words, figures which show what percentage of salary could be contributed toward pensions in behalf of every new entrant of average age coming into the city service without increasing the liabilities now being incurred, provided the liabilities, in terms of percentages of salary, were the same for all classes of the service. Such figures give for each type of benefit a single percentage representing the cost of that benefit, in terms of salary, as it is allowed in the city service considered as a unit; and this percentage serves as a standard of cost with which may be contrasted a similar figure representing the cost of the same benefit in any one of the existing funds. These standard costs, in terms of percentage of salary, are presented for each type of benefit in the service as a whole in table 224, on page 415, which also gives comparable figures for each benefit allowed in each of the existing funds. For each specific fund and for the standard or average fund, they relate to entrants coming in to the particular fund at the average age shown by the experience of that fund. Such single figures, showing the costs of the specified benefits as percentages of salaries are the resultants of all the forces upon which the costs of the separate benefits depend. They are not designed to analyze or explain why the cost of a given benefit, in proportion to salary, is twice as great in one fund as it is in the average or standard fund. They merely show that such is the difference, be the cause what it may, and that if equality of costs were to be established without additional liabilities being incurred, changes in the amount of benefit or the conditions upon which the benefit is granted will have to be made in such a way that the costs of that benefit will be reduced by half.

From these standard cost figures, as a starting point, it would be possible to work out for each branch of the service a different combination of conditions and benefits, believed to meet the needs of that branch in so far as they can be met without increasing liabilities, and yet have each fund like every other fund in so far as the costs of all the benefits, as percentages of salary, are concerned. Under such arrangements some funds would receive more than they now receive while others would receive less. This field of work, however, lies beyond the scope of the present report.

The method of deriving the standard costs, in terms of percentages of salaries, was as follows: For each fund the average age at entrance was determined, generally directly from the entrant's column of the actual experience tables for the active service, although in some cases the ages were

weighted in obtaining the averages according to the relative annuity value of future salary when it seemed advisable to make the figures somewhat more conservative. The costs of the pension benefits, expressed as percentages of salaries, were then worked for entrants at the average age for each fund. These figures were used as the average figures for the specified funds. These averages were then weighted according to the amount of the payrolls of the active service of the fund in which they applied and on this basis the weighted averages for the city service as a unit were derived. The standard figure is therefore a weighted average cost of the benefit to an average entrant of the city service, expressed as a percentage of salary. The following table shows the weights employed:

**TABLE 216—AVERAGES AND WEIGHTS USED IN PREPARING
WEIGHTED AVERAGE VALUES**

All Funds

Department or Class	Average Age of Entrants Nearest Year	Average Entrance Salary	Weight on Basis of Total Payroll	Weight on Basis of Number of Employees
Police Department Pension Fund....	26	1,000	.16487	.14557
Fire Department Relief Fund.....	26	1,000	.08168	.06762
School Teachers' Retirement Fund:				
Men.....	27	1,134	.06210	.03521
Women.....	24	762	.25189	.24273
Health Department Pension Fund:				
Men.....	31	886	.01052	.01171
Women.....	32	674	.00344	.00533
College of the City of New York Retirement Fund.....	31	989	.00526	.00294
City of New York Employees' Retirement Fund:				
Clerks.....	30	981	.16499	.16574
Mechanics.....	34	1,266	.09846	.08187
Laborers.....	39	691	.09669	.16220
Department of Street Cleaning Relief and Pension Fund.....	35	800	.04927	.07325
Supreme Court, First Department, Retirement Fund.....	39	1,816	.00732	.00397
Supreme Court, Second Department, Retirement Fund.....	39	1,816	.00351	.00186
Total.....	..	...	1.00000	1.00000

**VALUES OF TOTAL BENEFITS AND SALARIES WITH
AVERAGE FOR ENTIRE SERVICE**

Under the discussion of each class of employees covered by pension is given a table showing the present value of the average total future salaries to be earned and the average present value of the various benefits that may be paid. The following table shows these values for the average entrant into each fund together with corresponding values covering the entire service.

TABLE 217—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS PAYABLE TO THESE MEMBERS AND THEIR FAMILIES. VALUES ARE BASED ON THE AGE AND SALARY OF THE AVERAGE ENTRANT INTO EACH FUND—ALL FUNDS

FUND OR CLASS	Total Future Salary	Total of All Pension Benefits	PENSIONS TO MEMBERS			Total Pensions to Widows	Total Pensions to Children	Total Pensions to Dependent Parents
			Total	Upon Service Retirement	Upon Disability Retirement			
Fire Department Relief Fund.....	\$17,751	\$3,505	\$2,600	\$1,085	\$615	\$820	\$45	\$40
Police Pension Fund.....	17,234	2,562	1,927	374	1,553	606	25	4
Teachers' Retirement Fund—Men.....	29,100	1,208	1,208	1,080	128	...	...	...
Supreme Court, First Department, Retirement Fund.....	27,343	1,186	1,186	1,132	54	...	...	...
Teachers' Retirement Fund—Women.....	14,124	1,019	1,019	847	172	...	...	...
Supreme Court, Second Department, Retirement Fund.....	27,343	946	946	946	...	...	...	...
Department of Street Cleaning Relief and Pension Fund.....	8,396	716	336	51	285	346	12	22
College of the City of New York Retirement Fund.....	14,489	492	492	492	...	...	...	...
Health Department Pension Fund—								
Men.....	6,396	456	424	371	53	27	2	3
Women.....	4,569	314	311	271	40	...	...	3
City of New York Employees' Retirement Fund—								
Mechanics.....	12,183	176	176	176	...	...	...	...
Clerks.....	8,697	101	101	101	...	...	...	...
Laborers.....	5,268	42	42	42	...	...	...	...
Average Fund.....	\$12,371	\$883	\$726	\$442	\$285	\$146	\$6	\$5

TOTAL OF ACTIVE SERVICE AND PENSION ROLLS

The following tables, which are similar to those given in section II of the report dealing with the individual funds, give the complete active service and pension rolls which have been considered in the valuations:

TABLE 218—NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY AGE WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

All Funds

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
15	11	\$3,540	76,906	\$99,206,430	54	1,233	\$1,773,420	9,845	\$13,213,590
16	106	33,830	76,895	99,202,890	55	1,088	1,512,140	8,612	11,440,170
17	135	41,290	76,789	99,169,060	56	855	1,215,460	7,524	9,928,030
18	171	58,520	76,654	99,127,770	57	711	1,026,620	6,669	8,712,570
19	200	91,840	76,483	99,069,250	58	698	902,200	5,958	7,685,950
20	496	304,720	76,283	98,977,410	59	613	783,580	5,260	6,783,750
21	848	584,150	75,787	98,672,690	60	584	759,450	4,647	6,000,170
22	1,377	1,019,070	74,939	98,088,540	61	482	684,750	4,063	5,240,720
23	1,842	1,484,650	73,562	97,069,470	62	443	559,920	3,581	4,555,970
24	1,999	1,702,660	71,720	95,584,820	63	299	417,190	3,138	3,996,050
25	2,277	2,033,890	69,721	93,882,160	64	392	527,070	2,839	3,578,860
26	2,295	2,148,410	67,444	91,848,270	65	313	401,200	2,447	3,051,790
27	2,274	2,353,290	65,149	89,699,860	66	332	433,730	2,134	2,650,590
28	2,496	2,709,950	62,875	87,346,570	67	245	316,620	1,802	2,216,860
29	2,587	2,993,450	60,379	84,636,620	68	246	329,610	1,557	1,900,240
30	2,807	3,403,570	57,792	81,643,170	69	208	269,400	1,311	1,570,630
31	2,938	3,334,930	54,985	78,239,600	70	264	321,020	1,103	1,301,230
32	2,670	3,422,340	52,347	74,904,670	71	162	204,540	839	980,210
33	2,400	3,248,200	49,677	71,482,330	72	147	168,340	677	775,670
34	2,606	3,564,710	47,277	68,234,130	73	88	96,480	530	607,330
35	2,502	3,506,330	44,671	64,669,420	74	130	162,740	442	510,850
36	2,496	3,525,460	42,169	61,163,090	75	83	100,310	312	348,110
37	2,307	3,359,830	39,673	57,637,630	76	55	62,310	229	247,800
38	2,554	3,721,960	37,366	54,277,800	77	54	63,840	174	185,490
39	2,191	3,201,740	34,812	50,555,840	78	31	35,310	120	121,650
40	2,265	3,395,160	32,621	47,354,100	79	21	22,160	89	86,340
41	2,037	3,154,310	30,356	43,958,940	80	20	19,140	68	64,180
42	2,134	3,224,170	28,319	40,804,630	81	13	12,940	48	45,040
43	1,662	2,532,780	26,185	37,580,460	82	9	7,890	35	32,100
44	1,963	2,993,530	24,523	35,047,680	83	4	3,590	26	24,210
45	1,804	2,708,520	22,560	32,054,150	84	9	7,610	22	20,620
46	1,725	2,650,620	20,756	29,345,630	85	4	3,920	13	13,010
47	1,550	2,357,100	19,031	26,695,010	86	5	4,510	9	9,090
48	1,466	2,158,110	17,481	24,337,910	87	1	720	4	4,580
49	1,321	1,976,230	16,015	22,179,800	88	...	...	3	3,860
50	1,380	1,893,740	14,694	20,203,570	89	2	3,300	3	3,860
51	1,248	1,854,050	13,314	18,309,830	90	...	...	1	560
52	1,156	1,674,760	12,066	16,455,780	91	1	560	1	560
53	1,065	1,567,430	10,910	14,781,020	..	...	...	...	...

TABLE 219—NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

All Funds

Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service — Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	4,990	\$5,323,420	76,906	\$99,206,430	16	2,487	\$3,749,580	14,477	\$24,593,690
1	6,661	6,484,459	71,916	93,883,010	17	1,498	2,460,340	11,990	20,844,110
2	6,039	5,812,090	65,215	87,398,560	18	1,920	3,153,400	10,492	18,383,770
3	4,760	4,865,990	59,216	81,586,470	19	1,460	2,312,730	8,572	15,230,370
4	4,500	5,383,090	54,456	76,720,480	20	896	1,435,810	7,112	12,917,640
5	3,721	4,196,750	49,956	71,337,390	21	814	1,379,210	6,216	11,491,830
6	4,162	5,224,230	46,235	67,140,640	22	757	1,235,440	5,402	10,112,620
7	5,212	6,723,200	42,073	61,916,410	23	556	1,092,370	4,645	8,877,180
8	4,350	5,348,140	36,801	55,193,210	24	566	988,140	4,089	7,874,810
9	3,900	4,953,010	32,511	49,845,070	25	517	893,320	3,523	6,886,670
10	2,892	3,829,270	28,611	44,892,060	26	442	837,740	3,006	5,993,350
11	3,234	4,483,130	25,719	41,062,790	27	300	797,370	2,564	5,155,010
12	2,646	3,796,650	22,485	36,579,660	28	359	677,340	2,204	4,448,240
13	1,986	3,098,630	19,859	32,783,010	29	267	549,400	1,845	3,770,900
14	1,556	2,415,050	17,853	29,684,380	30 &	1,578	3,221,500	1,578	3,221,500
15	1,820	2,675,640	16,297	27,269,330	over				

TABLE 220—NUMBER AND PENSIONS OF EMPLOYEE PENSIONERS CLASSIFIED BY AGE

All Funds

AGE	SERVICE		DISABILITY		AGE	SERVICE		DISABILITY	
	Num-ber	Pensions	Num-ber	Pensions		Num-ber	Pensions	Num-ber	Pensions
25	...	...	1	\$400	60	104	\$89,380	73	\$48,440
26	...	...	...	...	61	120	96,220	47	31,470
27	...	...	...	...	62	107	86,380	69	44,640
28	...	...	2	930	63	94	77,620	39	25,510
29	...	...	4	1,670	64	110	92,490	50	32,140
30	...	...	6	2,900	65	124	98,630	48	28,420
31	...	...	4	1,510	66	130	109,360	42	26,150
32	...	...	7	3,300	67	126	101,740	53	32,760
33	...	...	8	3,690	68	146	118,060	45	29,710
34	...	...	5	2,630	69	145	114,830	44	22,640
35	...	...	14	8,120	70	126	95,630	33	23,310
36	...	...	17	7,510	71	118	95,840	20	11,180
37	...	...	16	9,330	72	118	95,420	20	11,800
38	...	...	19	9,460	73	85	72,800	14	7,840
39	1	\$1,280	28	15,770	74	72	59,200	14	11,140
40	1	750	46	27,110	75	68	53,210	17	13,350
41	1	450	45	29,330	76	47	37,440	12	8,120
42	1	700	53	31,830	77	42	35,990	9	6,950
43	3	3,300	50	32,010	78	31	27,440	7	3,620
44	6	5,900	73	46,790	79	21	16,410	8	5,690
45	12	10,500	69	48,180	80	21	15,800	2	3,200
46	13	17,270	78	49,510	81	22	18,730	1	390
47	25	27,830	108	73,610	82	10	9,490	3	1,700
48	21	19,840	112	80,010	83	11	16,390	5	3,070
49	27	26,210	90	63,310	84	9	7,610	...	...
50	24	22,750	106	75,300	85	5	3,810	2	900
51	42	43,710	140	99,840	86	1	1,500	...	...
52	51	41,430	174	129,070	87	1	600	1	1,380
53	72	66,050	157	112,440	88	1	600	2	391
54	55	47,740	149	107,600	89	1	600	1	1,000
55	78	65,400	145	110,250	90	2	1,510	...	...
56	105	89,720	127	91,840	91	1	1,500	...	...
57	106	85,800	102	71,320					
58	117	96,090	91	68,470					
59	90	77,680	71	50,920	Total	2,870	\$2,402,630	2,788	\$1,902,871

TABLE 221—NUMBER AND PENSION OF CHILDREN, WIDOWS AND
CLASSIFIED BY AGE

All Funds

CHILDREN PENSIONERS			WIDOW PENSIONERS			DEPENDENT PARENT PENSIONERS			AGE			WIDOW PENSIONERS			DEPENDENT PARENT PENSIONERS		
Age	Number	Pensions	Age	Number	Pensions	Age	Number	Pensions	Age	Number	Pensions	Age	Number	Pensions	Age	Number	Pensions
1	..	...	25	1	\$600	63	..	...	63	55	\$16,940	63	..	...	63	2	\$600
2	2	\$220	26	..	...	64	..	...	64	68	20,420	64	..	...	64	..	...
3	1	150	27	5	1,800	65	..	...	65	56	16,690	65	..	...	65	3	1,100
4	3	370	28	6	2,800	66	..	...	66	49	15,050	66	..	...	66	4	1,400
5	2	420	29	8	3,800	67	..	...	67	42	12,220	67	..	...	67	3	1,100
6	5	580	30	11	3,700	68	..	...	68	46	13,700	68	..	...	68	1	300
7	4	600	31	11	4,000	69	..	...	69	42	12,600	69	..	...	69	1	500
8	6	680	32	21	7,400	70	..	...	70	38	12,550	70	..	...	70	2	800
9	7	810	33	24	9,060	71	..	...	71	28	8,250	71	..	...	71	2	600
10	12	2,010	34	27	9,500	72	..	...	72	40	11,800	72	..	...	72	2	600
11	15	1,720	35	19	5,400	73	..	...	73	23	6,740	73	..	...	73	..	...
12	17	2,270	36	28	8,880	74	..	...	74	30	8,820	74	..	...	74	3	850
13	14	2,240	37	31	10,040	75	..	...	75	21	6,300	75	..	...	75	3	1,100
14	26	4,510	38	29	9,650	76	..	...	76	19	5,380	76	..	...	76	2	600
15	27	5,390	39	44	15,200	77	..	...	77	9	2,700	77	..	...	77	2	600
16	28	4,390	40	47	15,640	78	..	...	78	10	3,000	78	..	...	78	..	...
17	16	2,120	41	47	13,800	79	..	...	79	10	3,030	79	..	...	79	1	300
18	17	2,100	42	55	16,760	80	..	...	80	8	2,400	80	..	...	80	..	...
..	..	...	43	42	13,880	81	..	...	81	4	1,200	81	..	...	81	2	600
..	..	...	44	52	16,300	82	..	...	82	5	1,380	82	..	...	82	2	900
..	..	...	45	63	19,600	83	..	...	83	5	1,500	83	..	...	83	1	300
..	..	...	46	61	18,700	84	..	...	84	3	900	84	..	...	84	..	...
..	..	...	47	59	18,080	85	..	...	85	5	1,320	85	..	...	85	2	500
..	..	...	48	71	21,620	86	..	...	86	..	...	86	..	...	86	..	...
..	..	...	49	62	18,720	87	..	...	87	1	300	87	..	...	87	..	...
..	..	...	50	70	20,200	88	..	...	88	1	300	88	..	...	88	..	...
..	..	...	51	65	18,900	89	..	...	89	1	300	89	..	...	89	..	...
..	..	...	52	65	20,500	90	..	...	90	2	600	90	..	...	90	..	...
..	..	...	53	62	18,680	91	..	...	91	..	...	91	..	...	91	1	300
..	..	...	54	85	26,020	92	..	...	92	..	...	92	..	...	92	..	...
..	..	...	55	53	15,600	93	..	...	93	..	...	93	..	...	93	..	...
..	..	...	56	62	17,880	94	..	...	94	..	...	94	..	...	94	..	...
..	..	...	57	48	14,400	95	..	...	95	..	...	95	..	...	95	..	...
..	..	...	58	49	15,380	96	..	...	96	..	...	96	..	...	96	..	...
..	..	...	59	58	17,800	97	..	...	97	..	...	97	..	...	97	..	...
..	..	...	60	53	15,400	98	..	...	98	..	...	98	..	...	98	..	...
..	..	...	61	68	19,920	99	..	...	99	1	120	99	..	...	99	..	...
..	..	...	62	42	13,000	100	..	...	100	..	...	100	..	...	100	..	...
Total	202	\$30,580	...	..	...	...	..	...	...	2,226	\$685,120	...	..	...	...	53	\$17,790

VALUATION BALANCE SHEET COVERING ALL

The following valuation balance sheet represents a consolidation of all shows the total assets and liabilities of all the pension funds combined:

TABLE 222—A VALUATION OF ASSETS AND LIABILITIES OF YORK—VALUED AS

LIABILITIES		
Item		Present Value of Payments to be Made
Pensions to 8,139 Pensioners now on the pension rolls of the fund as follows:		
Service Pensioners:		
2,870 Annual pensions aggregating.....	\$2,402,630	\$21,187,291
Disability Pensioners:		
2,788 Annual pensions aggregating.....	1,902,871	18,680,181
Widow Pensioners:		
2,226 Annual pensions aggregating.....	685,120	7,985,698
Children Pensioners:		
202 Annual pensions aggregating.....	30,580	124,033
Dependent Parent Pensioners:		
53 Annual pensions aggregating.....	17,790	142,773
Total Pensions Entered Upon.....		\$48,119,976
Pensions to Dependents of present pensioners:		
Widows' Pensions:		
Widows of Service Pensioners.....		\$1,611,023
Widows of Disability Pensioners.....		3,098,020
Children's Pensions:		
Children of Service Pensioners.....		24,043
Children of Disability Pensioners.....		98,646
Total Prospective Pensions to Dependents of Present Pensioners.....		\$4,831,732
Pensions to such Employees as will retire from the present active force of 76,906 employees:		
Service Pensions.....		\$98,296,775
Disability Pensions, on account of:		
Actual Performance of Duty.....		919,437
**Other Causes.....		43,593,126
Total Prospective Pensions to Employees.....		\$142,809,338
Pensions to Dependents of such employees of the present active force as will die in service or while on pension:		
Widows' Pensions:		
Widows of employees who will die in Performance of Duty...		\$1,105,767
Widows of employees who will die from Other Causes in service.....		5,714,625
Widows of employees who will die on Service Pension.....		4,431,845
Widows of employees who will die on Disability Pension.....		7,592,055
Children's Pensions:		
Children of employees who will die in Performance of Duty...		51,748
Children of employees who will die from Other Causes.....		276,329
Children of employees who will die on Service Pension.....		92,897
Children of employees who will die on Disability Pension...		258,815
Dependent Parents' Pensions:		
Parents of employees who will die in Performance of Duty...		60,554
Parents of employees who will die from Other Causes in service.....		174,732
Total Prospective Pensions to Dependents of Employees in Service.....		\$19,759,367
Total Pensions Not Entered Upon.....		\$167,400,437
Grand Total.....		\$215,520,413

**NOTE—The liability for disability pension in funds not having special provisions covering disability in actual performance of duty has been included in this item.

The following table shows the estimated amount of appropriation which or revocation of pension. This table does not take into account the interest as the pensions become payable. It simply shows the actual payments which to persons now on the roll; that is, present pensioners.

TABLE 223—AGGREGATE AND DETAILED ANNUAL COST

All

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
0	1914	\$1,849,268	\$2,334,584	\$674,942	\$29,479	\$17,187	\$4,905,460
1	1915	1,751,507	2,212,812	652,570	26,227	16,071	4,659,187
2	1916	1,660,273	2,092,494	630,448	21,790	14,793	4,419,798
3	1917	1,573,702	1,973,303	608,394	16,391	13,957	4,185,807
4	1918	1,491,246	1,856,043	586,381	11,388	12,945	3,958,003
5	1919	1,412,380	1,737,143	564,658	9,620	11,974	3,735,775
6	1920	1,336,878	1,627,417	543,003	7,388	11,047	3,525,733
7	1921	1,264,406	1,516,884	521,496	5,681	10,166	3,318,633
8	1922	1,194,768	1,409,245	499,218	3,705	9,329	3,116,265
9	1923	1,127,588	1,304,600	479,161	2,908	8,534	2,922,791
10	1924	1,061,750	1,204,209	459,332	2,242	7,777	2,735,310
11	1925	999,894	1,107,190	437,757	1,659	7,060	2,553,560
12	1926	939,646	1,015,163	417,362	1,099	6,384	2,379,654
13	1927	899,431	925,309	397,494	697	5,752	2,228,683
14	1928	825,091	840,841	377,861	346	5,161	2,049,300
15	1929	770,834	741,761	359,413	204	4,616	1,876,828
16	1930	718,261	669,931	339,745	...	4,116	1,732,053
17	1931	668,528	603,163	321,291	...	3,657	1,596,639
18	1932	619,392	520,930	303,274	...	3,234	1,446,830
19	1933	572,711	483,142	284,914	...	2,844	1,343,611
20	1934	528,098	440,421	268,757	...	2,485	1,239,761
21	1935	485,385	380,482	252,077	...	2,158	1,120,102
22	1936	444,572	334,925	236,039	...	1,867	1,017,403
23	1937	405,665	293,061	220,573	...	1,607	920,906
24	1938	368,673	254,826	205,612	...	1,375	830,486
25	1939	333,567	220,142	191,237	...	1,169	746,115
26	1940	300,355	188,808	177,449	...	984	667,596
27	1941	268,968	160,604	164,261	...	824	594,657
28	1942	239,460	135,366	151,647	...	682	527,155
29	1943	211,765	112,891	139,622	...	559	464,837
30	1944	185,895	93,197	128,208	...	453	407,753
31	1945	161,903	76,068	117,294	...	365	355,630
32	1946	139,778	61,361	107,117	...	291	308,547
33	1947	119,561	48,886	97,448	...	230	266,125
34	1948	100,673	38,434	88,393	...	180	227,680
35	1949	84,911	29,764	79,892	...	137	194,704
36	1950	70,568	22,668	71,959	...	101	165,296
37	1951	57,887	16,965	64,569	...	73	139,494

*Date—Year beginning July 1st.

will be required to continue the pensions of present pensioners until death factor as it does not affect the appropriation if the amounts are appropriated are represented in the balance sheet by the present value of future pensions

OF PENSIONS TO PERSONS ON THE PENSION ROLL

Funds

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
38	1952	\$47,101	\$12,456	\$57,708	...	\$52	\$117,317
39	1953	37,948	8,971	51,347	...	36	98,302
40	1954	30,281	6,344	45,512	...	26	82,163
41	1955	23,060	4,406	40,136	...	16	68,518
42	1956	18,772	3,016	35,227	...	9	57,024
43	1957	14,588	2,038	30,760	...	4	47,390
44	1958	11,241	1,355	26,729	...	2	39,327
45	1959	8,573	890	23,093	...	...	32,556
46	1960	6,880	582	19,847	...	...	27,309
47	1961	4,865	382	16,952	...	...	22,199
48	1962	3,603	235	14,381	...	...	18,219
49	1963	2,645	154	12,124	...	...	14,923
50	1964	1,919	101	10,153	...	...	12,173
51	1965	1,379	60	8,358	...	...	9,797
52	1966	980	38	6,957	...	...	7,975
53	1967	692	23	5,684	...	...	6,399
54	1968	483	13	4,598	...	...	5,094
55	1969	338	6	3,676	...	...	4,020
56	1970	233	2	2,907	...	...	3,142
57	1971	151	1	2,280	...	...	2,432
58	1972	107	...	1,765	...	...	1,872
59	1973	69	...	1,345	...	...	1,414
60	1974	42	...	1,011	...	...	1,053
61	1975	26	...	747	...	...	773
62	1976	16	...	537	...	...	553
63	1977	8	...	369	...	...	377
64	1978	3	...	244	...	...	247
65	1979	1	...	158	...	...	159
66	1980	...	...	96	...	...	96
67	1981	...	...	54	...	...	54
68	1982	...	...	29	...	...	29
69	1983	...	...	13	...	...	13
70	1984	...	...	5	...	...	5
71	1985	...	...	2	...	...	2
72	1986	...	...	1	...	...	1
Total		\$27,462,142	\$29,126,166	\$12,645,673	\$140,824	\$192,289	\$69,567,094

**PERCENTAGES OF SALARIES REQUIRED TO PAY
PENSIONS TO FUTURE ENTRANTS WITH
AVERAGES FOR ENTIRE SERVICE**

Under the discussion of each class of employees covered by *pension* is given a table showing for each age of entrance the cost of the benefits allowed to them, expressed as a percentage of salary paid. The following table shows the percentages for each fund according to the average age of entrants into the fund, together with corresponding percentages covering the entire service:

TABLE 224—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES FOR THE AVERAGE AGE AT ENTRANCE INTO EACH FUND

All Funds

Fund or Class	Total All Pensions	Pension to Employees						Pension to Widows of				Pension to Children of				Pension to Dependent Parents of	
		Total Pensions	Service Pensions	Disability Pensions			Total	Total	Actives Dying		Total	Actives Dying		Total	Actives Dying	Actives Dying	
				In Performance of Duty	Not in Performance of Duty				In Performance of Duty	Not in Performance of Duty		In Performance of Duty	Not in Performance of Duty				
					No Limitation	With Service of Less Than 10 Years											With Service of 10 Years or More
Fire Department Relief Fund.....	19.73	14.64	11.17	3.47	.24	.35	2.88	4.62	.75	1.25	2.62	.05	.09	.11	.06	.16	
Police Pension Fund.....	14.99	11.20	2.18	9.02	.52	...	8.50	3.62	.17	1.26	2.19	.01	.06	.07	.03	...	
Department of Street Cleaning Relief and Pension Fund.....	8.55	4.02	.61	3.41	.06	...	3.35	4.12	.66	1.27	2.19	.03	.05	.07	.03	.23	
Health Department Pension Fund: Men.....	7.36	6.68	5.81	.87	.72	...	.15	.58	...	...	...	.04	...	...	.06	...
Teachers' Retirement Fund: Women.....	7.17	7.17	5.95	1.22	...	...	...	...	...	...	...	...	...	...	...	...
Health Department Pension Fund: Women.....	6.89	6.83	5.92	.91	.74	...	.17	...	...	...	...	...	...	...	.06	...
Supreme Court, First Department, Retirement Fund.....	4.64	4.64	4.42	.22	...	...	...	...	...	...	...	...	...	...	...	...
Teachers' Retirement Fund: Men.....	4.13	4.13	3.69	.44	...	...	...	...	...	...	...	...	...	...	...	...
Supreme Court, Second Department, Retirement Fund.....	3.46	3.46	3.46	...	...	...	...	...	...	...	...	...	...	...	...	...
College of the City of New York Retirement Fund.....	3.40	3.40	3.40	...	...	...	...	...	...	...	...	...	...	...	...	...
City of New York Employees' Retirement Fund: Mechanics.....	1.43	1.43	1.43	
Clerks.....	1.16	1.16	1.16	
Laborers.....	.80	.80	.80	
Average Fund.....	7.14	5.87	3.57	2.30	1.180504	...	

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